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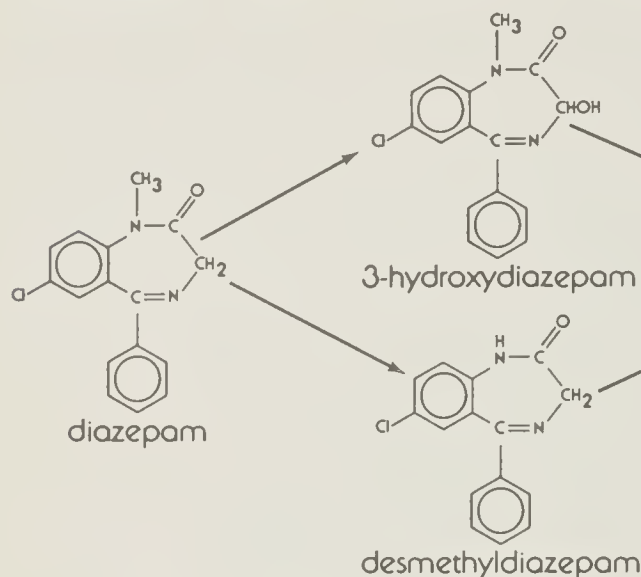
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Valium (diazepam) is a benzodiazepine with a distinctive pharmacokinetic profile

The pharmacokinetic profile of Valium is one of the characteristics that sets it apart from other benzodiazepines. Consider, in particular, the metabolic pathway of Valium. The three major metabolites of Valium exhibit significant pharmacologic activity—and so, of course, does the parent substance—diazepam itself. All combine to produce the characteristic clinical response seen with Valium. The response you have come to know, to want and to trust.

Pharmacokinetic studies also demonstrate that Valium has a pattern of absorption, distribution, metabolism and elimination that is reliable and consistent. And, although the pharmacokinetics of a drug cannot, at present, be specifically related to its clinical effects, it is clearly a factor that distinguishes one product from another by providing important insights into how each moves through the patient's body.

Valium® (diazepam) ^{IV}

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tension and anxiety

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due

to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome; convulsive disorders (not for sole therapy).

Contraindicated:

Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma;

may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients.

Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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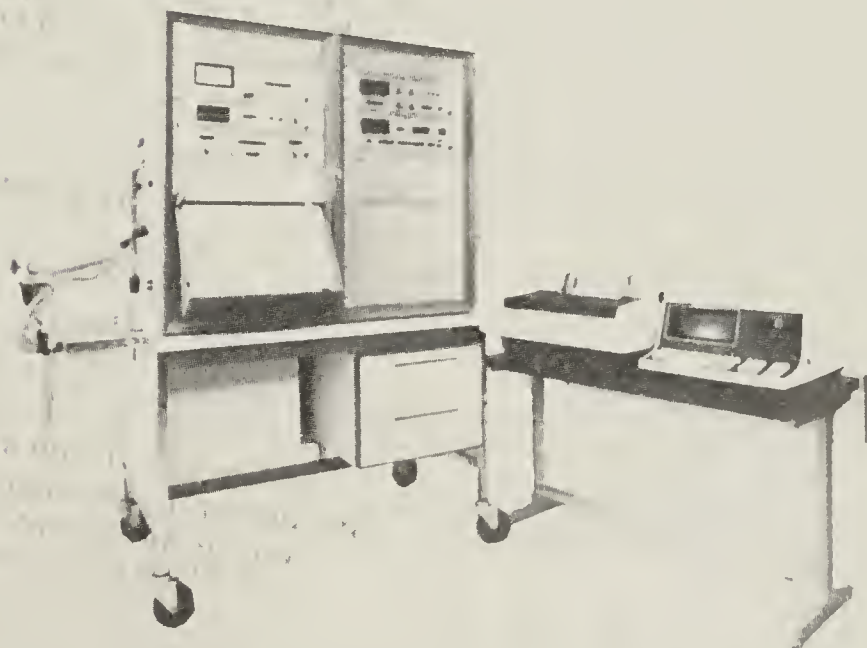
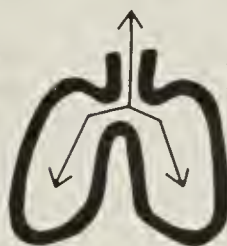
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ARIZONA MEDICINE

JOURNAL OF ARIZONA MEDICAL ASSOCIATION

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Published monthly by The Arizona Medical
Association, Inc., with offices at 810 W.
Bethany Home Rd., Phoenix, Arizona 85013.
Subscription \$20 a year, single copy \$2.00.
Second class postage paid at Phoenix, Ari-
zona, and at additional mailing offices.

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ARIZONA MEDICINE



RECENT CHANGES

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**Health care doesn't
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**Drug firms challenge
'MAC' rules**

**Drug
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RESEARCH

Mailgram

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.



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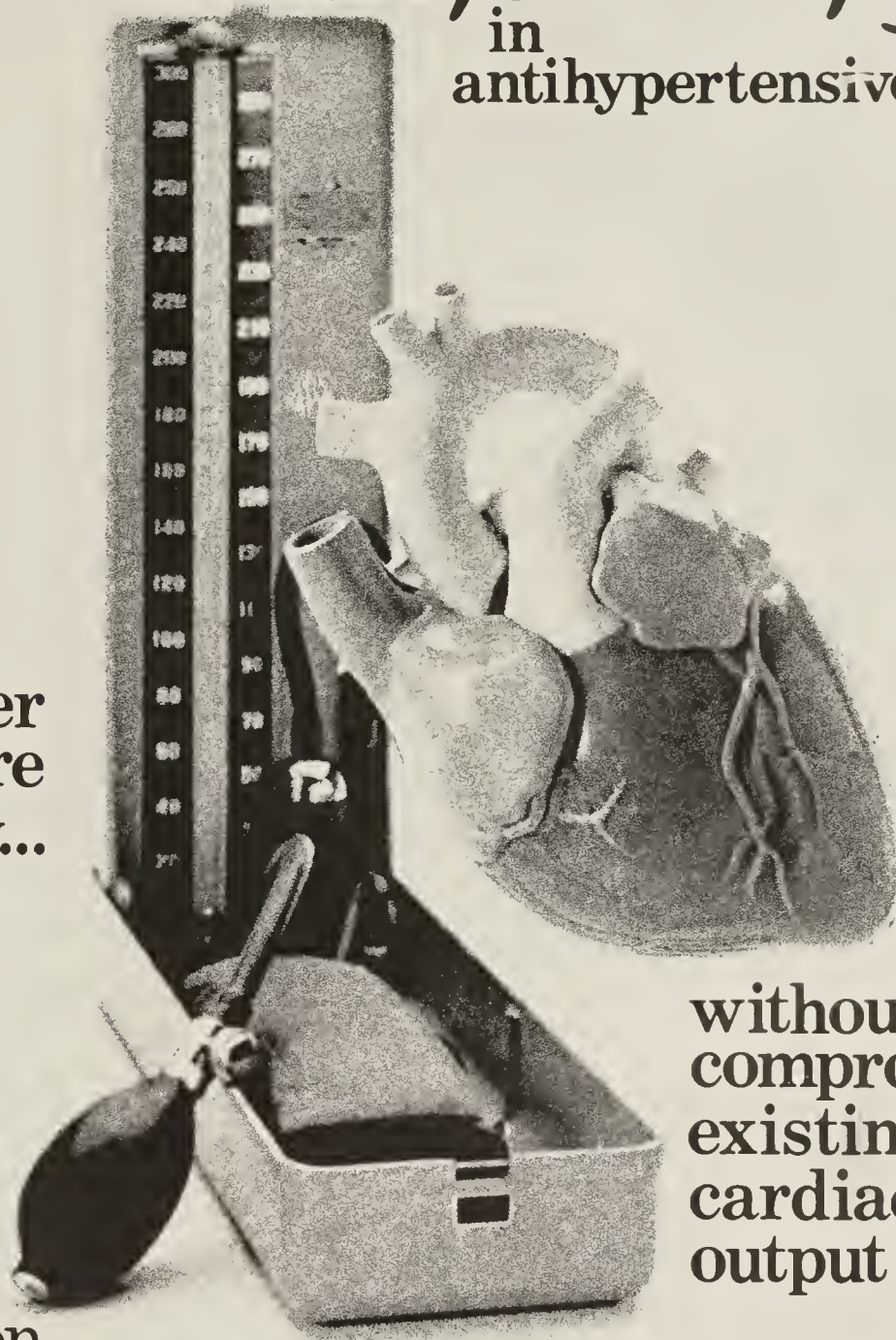
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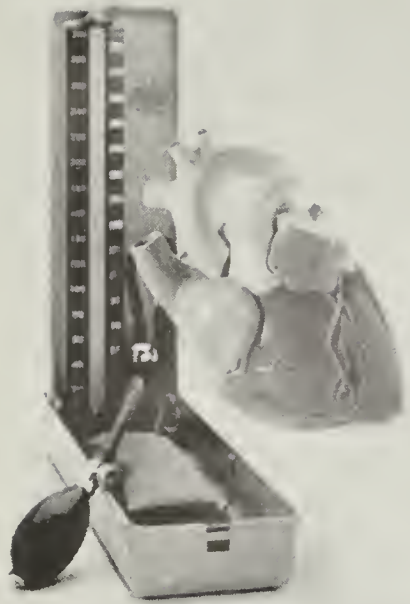
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Contraindications: Active hepatic disease, such as acute hepatitis and active cirrhosis; if previous methyldopa therapy has been associated with liver disorders (see Warnings); hypersensitivity

Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or

cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Use in Pregnancy: Use of any drug in women who are or may become pregnant requires that anticipated benefits be weighed against possible risks; possibility of fetal injury can not be excluded.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses of anesthetics; hypotension occurring during anesthesia usually can be controlled with vasopressors. Hypertension has recurred after dialysis in patients on methyldopa because the drug is removed by this procedure.

Adverse Reactions: *Central nervous system:* Sedation, headache, asthenia or weakness, usually early and transient; dizziness, lightheadedness, symptoms of cerebrovascular insufficiency, paresthesias, parkinsonism, Bell's palsy, decreased mental acuity, involuntary choreoathetotic movements; psychic disturbances, including nightmares and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angina pectoris. Orthostatic hypotension (decrease daily dosage). Edema (and weight gain) usually relieved by use of a diuretic. (Discontinue methyldopa if edema progresses or signs of heart failure appear.)

Gastrointestinal: Nausea, vomiting, distention, constipation, flatus, diarrhea, mild dryness of mouth, sore or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundice, liver disorders.

Hematologic: Positive Coombs test, hemolytic anemia. Leukopenia, granulocytopenia, thrombocytopenia.

Allergic: Drug-related fever, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlargement, gynecomastia, lactation, impotence, decreased libido, dermatologic reactions including eczema and lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited to 500 mg daily when given with antihypertensives other than thiazides. Tolerance may occur, usually between second and third month of therapy; increased dosage or adding a thiazide frequently restores effective control. Patients with impaired renal function may respond to smaller doses. Syncope in older patients may be related to increased sensitivity and advanced arteriosclerotic vascular disease; this may be avoided by lower doses.

How Supplied: Tablets, containing 125 mg methyldopa each, in bottles of 100; Tablets, containing 250 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 1000; Tablets, containing 500 mg methyldopa each, in single-unit packages of 100 and bottles of 100.

For more detailed information, consult your MSD representative or see full prescribing information. Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa. 19486

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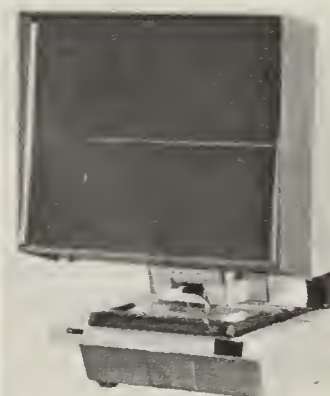
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SUSTAINED ACTION

Each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine HCl, and 2 mg phenobarbital; the alcohol content is 15%.

See next page for brief summary



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Contraindications. Sensitivity to any of the ingredients; porphyria.

Warnings. Drowsiness may occur. PHENOBARBITAL MAY BE HABIT-FORMING.

Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

Average Dosage. *Prophylactic or Therapeutic.*

Tedral: *Adults*—One or two tablets every 4 hours. *Children*—(Over 60 lb) one-half the adult dose.

Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: *Note:* One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

Supplied. Tedral: White, uncoated scored tablets in bottles of 24 (N 0047-0230-24), 100 (N 0047-0230-51) and 1000 (N 0047-0230-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0230-11).

Tedral SA: Double-layered, uncoated, coral/mottled white tablets in bottles of 100 (N 0047-0231-51) and 1000 (N 0047-0231-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0231-11).

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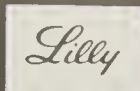
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SUBXYPHOID EPICARDIAL PACEMAKERS: An Alternative to the Transvenous Approach

WILLIAM P. CORNELL, M.D.
JEREMY TORSTVEIT, M.D.

ABSTRACT

The subxyphoid approach to epicardial pacemaker placement was introduced as a method to obtain the long term reliability of an epicardial system with the low operative morbidity and mortality of the transvenous procedures. Using a similar technique from March 1973 to August 1976, 54 patients at our institution had permanent subxyphoid epicardial pacemakers implanted. Effective cardiac pacing was established in every case and we found the procedure to be tolerated well with no operative mortality. Long term electrode failure occurred in two patients (4%). Despite a significant long term complication rate, the transvenous pacemaker remains the most popular pacing system used today. The safety of implantation and long term reliability of the subxyphoid, epicardial pacemaker appear to make it a better choice for patients requiring permanent cardiac pacing.

A recent comparative study of all modes of permanent pacemaker implantation included that the subdiaphragmatic epicardial pacemaker was overall, the least traumatic to the patient and the most trouble free in long term follow-up.¹ Transvenous pacemaker implantation carries an initially lower risk to the patient than the epicardial pacemaker placement requiring formal thoracotomy and, hence transvenous types are used most frequently.^{1,2,3}

Long term complications with transvenous pacemakers are, however, frequent and the epicardial systems have demonstrated a greater long term reliability.^{4,5} Transvenous lead displacement has been reported in the range of 14% to 30% in

several series.^{4,5,6} Perforation of the ventricle and problems with skin erosion by wire or pulse generator are known complications of transvenous pacemakers, and since the electrode is an indwelling intravenous foreign body, thrombosis and endocarditis are also possible.⁴

The development of a sturdy, sutureless, screw-in electrode allowed for limited exposure techniques to be used in epicardial pacemaker implantations. The immediate operative morbidity and mortality using these techniques is comparable to the transvenous approaches.^{5,7}

PATIENTS

Fifty-four patients ranging in age from 47 years to 92 years with a mean age of 69 years underwent placement of subxyphoid epicardial pacemakers.

Indications for surgery were heart block in 34 patients, tachycardia-bradycardia syndrome in 10, atrial arrhythmia with bradycardia in 7 and sinus bradycardia in 3.

Six patients had permanent transvenous pacemakers already in place with electrode displacement or ventricular perforation. Perforations with temporary transvenous pacemakers had occurred in four others. Electrode erosion of the skin with infection was present in two of the patients with permanent transvenous pacemakers. In one patient, an attempt at transvenous implantation had been unsuccessful. Another patient with a transthoracic epicardial system required revision because of poor capture due to lead corrosion.

METHODS

The patient is placed supine on the operating table and the abdomen and chest are sterily prepared and draped. An upper midline incision is made and the fascia is divided but the peritoneal cavity is not entered. After excising the xyphoid,

the pericardium is opened under the sternum. Blunt dissection and retraction of the diaphragm exposes the right ventricular surface. In an area of myocardium free of fat and vessels, two sutureless electrodes* are placed two centimeters apart. Pacing thresholds for each lead are tested and the permanent pulse generator is connected. A subcutaneous pocket is made to the left of the incision and the pericardium is loosely closed around the wires. The pulse generator and excess wire is placed in the pocket and the wound is closed in layers. A Hemovac drain is usually employed for 24 to 48 hours postoperatively.

Single electrodes were used in the first 10 procedures and in the remainder, a bipolar system was implanted.

Anesthesia for this procedure can be adjusted to the individual patient's condition and relative risks involved. The entire procedure has been performed using local anesthesia but since some discomfort is experienced during pericardial manipulation, light general anesthesia is usually given at this period in the procedure. Some procedures were done totally with general anesthesia.

RESULTS

Operative times ranged from 40 minutes to 90 minutes and averaged 55 minutes. Cardiac pacing was established early in the procedure, usually within the first 10 minutes.

Successful electrode placement and pacing was achieved in every patient with thresholds averaging less than one milliamperere.

Two hospital deaths were recorded with both patients suffering from intractable congestive heart failure. The deaths occurred several weeks after surgery and there was no pacemaker malfunction evident.

One patient with a fibrinous pericarditis due to perforation of a transvenous electrode eventually required a new transvenous pacer because of poor capture. One unipolar system was revised to bipolar because of an increased pacing threshold. During pulse generator changes, other electrode thresholds have been checked and have continued to be satisfactory. No other electrode problems have been reported in the remainder of the patients ranging from one month to 39 months after implantation.

Varying degrees of symptomatic pericardial reaction were present in seven patients and all were successfully treated. Removal of serous fluid around the wound was necessary in 17 patients. This is apparently due to a temporary leaking of pericardial fluid into the pacemaker pocket.

*Model 6917, Medtronic, Inc., Minneapolis, Minnesota

THIRD INTERNATIONAL COCCIDIOIDOMYCOSIS SYMPOSIUM

JOHN W. KENNEDY, M.D., Editor

Initially the pulse generators were placed beneath the rectus muscle but this technique was abandoned after two of the power packs eroded into the peritoneal cavity. In both patients cardiac pacing continued and after repositioning there were no further consequences. Currently, all pulse generators are placed above the rectus sheath in the subcutaneous tissue.

Power pack changes have presented no difficulty and there have been no skin problems or wound infections.

DISCUSSION

The long term reliability of epicardial pacemakers make their use advantageous. The subxyphoid approach is a safe way to establish such a pacemaking system. Successful cardiac pacing was established in all of our patients. Two patients later required electrode revision representing a 4% failure. The post pericardiotomy syndrome, our major complication, was present in 7 patients (13%) but this complication is treatable without interruption of cardiac pacing. In contrast, the major complications from transvenous pacemakers (reported up to 35%^{1,4,5,6}) often cause cardiac pacing to be interrupted and are therefore life threatening. The minor problems we encountered with the subxyphoid approach were largely due to accumulation of pericardial fluid at the operative site. In those cases, complications have not arisen from repeated aspirations, and in no patients has aspiration been necessary on a chronic basis.

We feel the safety and stability of the subxyphoid system has been demonstrated and an initially greater surgical procedure than the transvenous implantation can be justified in most patients. The new long life pulse generators and sturdy epicardial electrode inserted from below the diaphragm offer the greatest potential of all current methods, for safe, long term, trouble free cardiac pacing.

Those of you who attended the recent Tucson triumphant performance must have been inspired and instructed by the wide array of information on research work going on in this field.

As one speaker put it "Coccidioidomycosis may be a small pimple on the butt of the populace compared with the many other far more widespread diseases" but it certainly has its serious clinical and investigative followers.

The Madera Site, an archeological dig in California, on one project, 28 of 30 students came down with a disease. These sites had one thing in common. They all had acid soil, whereas the soil in adjacent areas might be highly alkaline. There was only one creosote bush reportedly in the immediate area, in contradistinction to the areas here in Arizona where the "creosote bush flourishes so does CI." Of the four sites 70 to 80% of the students had clinical symptoms of a disease and there was one case of CI meningitis.

There were several reports concerning the efficacy of Transfer Factor Therapy and they ranged from mild enthusiasm to stark disappointment in results. Some thought the Transfer Factor was an aid in immunological response and that there was frequently a skin test conversion in

cases with or without minimal clinical manifestations and in severe cases using the Transfer Factor in a few hours the skin test might become positive, revert negative and if recovery takes place might spontaneously revert back to positive. Some thought that some prognostic inference could be drawn from this. Others state that the skin test is not clear-cut as formerly thought to be a prognostic sign but the Transfer Factor helped to make it more readily obtainable. In other words, in severe cases who have an immunological defect or in mild cases in which the skin test is not yet positive the Transfer Factor might convert both of them to positive indicating the presence of the infection.

The late Doctor C.R. Smith reviewing the history of CI here in Phoenix at the second symposium in 1955 alluded to the fact that CI was a respectable disease until it went to the dogs here in Arizona. This was the first place in which it was proven that dogs were susceptible to the disease. He might have also stated that it is also where it went to the hogs and the cattle because here too, these animal recipients are vulnerable. In fact one paper had to do with a study of the Transfer Factor to CI in cattle from the University of Arizona. Indiana



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THE ARIZONA MEDICAL EYE UNIT



NEAL A. VANSELOW, M.D.

do have the Transfer Factor, indeed it convert negative skin test to positive if animal is of course infected, and it was suggested that when and if the Transfer Factor can be easily isolated from the animal this might serve as a source.

If you have difficulty with your skin test material you might go to sperulin. It is more likely to be positive in weak reactors. Don't use it in testing people who already have erythema multiforme, if the erythema is on the basis of CI infection you are imposing an unnecessary burden on the immunological system of a patient. Don't use it full strength, dilute it. The ideal chemotherapeutic agent for leishmaniasis still eludes the investigators. Photocyclophosphamide is still the standby but it should not be pushed to a dosage which is deleterious to the renal system. Miconazole, Econazole and Dioxolan-Imidazole. The therapy of experimental CI have not even been shown to be the answer to the problem.

Since this symposium was sponsored by the American College of Chest Physicians, there seems to be a great dearth of original papers. But the durable Dermot McKee and Austin Grant reviewed 300 cases of coccidioidomycosis which have been treated by surgery and Earl Baker, Hawkins and Eleanor Waskow almost won the entire meeting right out of the ether by showing that radical surgery was more effective than minimal or corneal surgery in the control of corneal CI associated with diabetes mellitus.

Well, you will have to wait until the proceedings of the meeting are published in order to relish the wide range of studies which are being conducted around this "all pimple". The morbidity and mortality of CI is on the increase here and is probably related to the widespread of immunosuppressive drugs, with which we assail the patients for a variety of reasons. Steroids, are a no-no.

On January 10, 1976, a new method for the delivery of eye care service was instituted at the University of Arizona. Through the efforts of the Odd Fellows and Rebekahs of Arizona, a fully equipped mobile eye clinic was donated to the Department of Surgery's Section of Ophthalmology. Joint sponsorship of the Unit is provided by the Arizona Ophthalmological Society and the University of Arizona Medical Center.

Due to a shortage of ophthalmological services in eight of Arizona's fourteen counties, the Arizona Medical Eye Unit was designed along with a complete program of eye screening and eye health education, to deliver medical eye examinations to the underserved rural areas of the state. Goals for the program include identification of sight threatening pathology and greater involvement of existing health care systems in the locations served. In addition, identification of blind or partially sighted persons along with the dissemination of services for the blind or

visually handicapped are included in the Arizona Medical Eye Unit Program.

A start up grant from the Max C. Fleischmann Foundation and the support of ten Arizona ophthalmologists, who volunteered to provide service for the Unit, made possible the examination of eleven hundred and twenty-nine persons in the Unit's first nine months of operation. Of this total, two hundred and forty-seven persons were found to have sufficient pathology for additional follow-up. The program is geared for the examination of up to three thousand persons annually providing there are enough volunteer ophthalmologists to assist in screening.

The Arizona Medical Eye Unit is a forty-foot fifth wheel trailer equipped with two ophthalmic examination rooms, two technician lanes and a waiting room. A wheel chair ramp can be deployed for the infirm or handicapped. The Unit is both self-contained and able to be connected to existing alternating current of the household standard circuitry. It is



possible for the Unit to be in the field for up to five days at one time. This facilitates thorough population coverage of an area when needed.

The Arizona Medical Eye Unit program operates under three separate program modes. The first is on request from a community. Any person who is not under the continuing care of an ophthalmologist is eligible. A fee for the service is charged to cover the cost of operations but no one is turned away for lack of funds. The second mode of operation is through the Arizona Department of Economic Security's Blind Services Division. Under this program, the Unit will serve low-income persons exclusively and only where there is a need as far as the Department of Economic Security is concerned. Finally,

requests for the service are frequently made by the Indian Health Service in various parts of the state to examine Indian populations when there is a need.

Follow-up care is provided in each type of program, but perhaps the most unique is that which is provided through the cooperation of local health practitioners. If a person is in need of a baseline examination for a more accurate diagnosis the local physician is encouraged to refer the patient to the Arizona Medical Eye unit when it is in a convenient location for both patient and referring physician. In this way patient records will remain under the control of the referring physician. This should insure continuity of care with the least amount of confusion.

The overall success of the program will

depend upon the response from both lay and professional community. The staff of the Arizona Medical Eye Unit, will respond to any requests as long as certain guidelines are agreed upon. Additional information is available upon request from the Arizona Medical Eye Unit, Department of Surgery, Arizona Health Sciences Center, Tucson, Arizona 85724. All inquiries should be made to the attention of either Martin C. Liss, Assistant Director of the program or to Harold E. Cross, Chief of the Section of Ophthalmology.

Neal A. Vanselow



President's Page

Was the House of Delegates Unresponsive to the Membership?

UNIFIED MEMBERSHIP



EDWARD SATTENSPIEL, M.D.

The House of Delegates of the Arizona Medical Association in special session on November 20, 1976, voted to maintain unified (mandatory) county society, state association and A.M.A. membership. This action was taken in the face of a poll which showed some 25% of the total membership (58% of the 43% who returned the poll) against unified membership, and only 16% (38% of the 43% returned) in favor of the status quo. Was the House of Delegates unresponsive to the membership? What about the 57% of our members who couldn't be bothered to return the poll? What about the fact that only 20%, one out of five, of those Delegates and Alternate Delegates notified 6 weeks in advance bothered to attend the special session?

Actually those present at the meeting were not unresponsive to the poll. A very extensive, thoughtful and considered debate occurred at which many salient facts were brought up, including the need for support of our most effective national voice and the somewhat changed political climate due in Washington this coming year. Some of the Delegates stated that they

knew that many of their colleagues had changed their minds since the poll was taken. Certainly, it can be agreed that those Delegates who were present were those physicians who are most concerned about the future of organized medicine and the well-being of our profession.

Personally, I believe the House made a wise decision. If you disagree, ask yourself if you were one of those who should have been present, or ask your like-minded Delegate friends where they were. There will be another meeting of the House in April.

Here's another aspect of the realities of the present day survival to consider. We need friends in the State Legislature, perennially. Did you contribute to the campaign of your district Representative or Senator? Do yourself (and the rest of us) a favor. Call up your State Senator or Representative and ask if they have any campaign deficit. Even a small contribution now will help to confirm our gratitude for past and hopefully future performances. If you've read this far, then do it now. Tomorrow will be too late.



HYPERTHERMIA:

Renewed Interest in an Old Treatment for Cancer

Michael R. Manning, M.D.

Editors: Stephen E. Jones, M.D., Associate Professor of Medicine, Section of Hematology Oncology, University of Arizona College of Medicine, Tucson, Arizona 85724; Robert H. Tenen, M.D., Dir., Radiation Oncology, Good Samaritan Hospital, Phoenix, Arizona 85006; Edwin W. Neubauer, M.D., General Surgeon, Country Club Road, Tucson, 85716.

INTRODUCTION AND HISTORICAL REVIEW

The use of heat alone as a cancer treatment modality was introduced in the nineteenth century. Coley^{1,2} described significant regressions of unresectable malignancies in a number of patients who had spontaneous elevation of body temperature due to erysipelas. Some of these patients survived for quite a long time without recurrence of their widespread disease. Coley then developed a mixture of pyrogenic toxins to induce fevers in patients with cancer without using actual bacteremia. He substantiated his previous observations with documentation of subjective and objective tumor responses in this group of patients. Most of the responses were in patients who had sustained temperatures greater than 101°F (39.4° Celsius). Below this level, there was little response. Coley continued to refine his pyrogenic toxins to cause less morbidity, making them less pyrogenic and, therefore, less effective against tumors. This particular application of hyperthermia did not become widely used during this era.

It was not until the 1930s that hyperthermia was again utilized. Warren³ studied 32 cases of advanced tumors treated with systemic hyperthermia induced by placing patients in cabinets heated by diathermy or carbon filament lamps. The patients' temperatures were raised to approximately 41.5°C and main-

tained at that level for 24 hours. General improvement was noted in 29 of 32 patients, and objective tumor regression was seen in the majority. Although there were no cures, it was noted that total body temperature of 41.5°C could be maintained for many hours, and that such hyperthermia resulted in objective tumor regression.

After Warren's work, little was done until the 1960s when Pettigrew⁴ studied systemic hyperthermia induced by placing cancer patients in a paraffin bath and administering heated air through an endotracheal tube. With monitoring of rectal and esophageal temperatures, the patients were heated to temperatures approximating 41.8°C. Pettigrew found that the patients tolerated this well and also noticed significant palliation in most cases, with clinical and radiologic evidence of tumor regression occurring in the majority of cases. The most promising tumor regressions were seen in patients with soft tissue sarcomas, gastrointestinal malignancies, and melanomas. In those patients who eventually came to autopsy, tumor necrosis was evident in most sites.

Local and regional hyperthermia studies utilizing perfusion with blood warmed to temperatures up to 43°C have been done by Cavaliere.⁵ He treated patients with melanoma of the extremities and found a 50% response rate with heat alone. Tumor control was obtained for periods ranging from 7 to 28 months.

Crile⁶ used local heating plus radiation to the tumor bed to treat five patients with osteogenic sarcoma. The exposed tumor was heated with microwaves to temperatures in the range of 60°C for approximately 15 minutes. Various doses of radiation were utilized. Two of the five patients had long-term survival and retained function of the involved limb.

Perfusions utilizing heated chemotherapeutic agents have been reported by Stehlin.⁷ Pre-warmed blood containing melphalan was perfused regionally into areas involved with melanoma. He noted a local response rate of 80% as compared to 38% when the agent was perfused without heating the blood. The temperature range in the skin and muscle of the involved limb was from 38°C to 40°C.

From this short, selective historical review, we note that: 1) hyperthermia alone is tumoricidal; 2) systemic hyperthermia in the range of 41.5°C - 41.8°C is tolerable; and 3) local or regional heating to temperatures ranging from 38°C to 43°C can be done safely.

Biologic Aspects of Hyperthermia

Even though tumor responses have been observed after local and systemic heating, the biology of cell killing by hyperthermia is not totally understood.

Hyperthermia alone can kill cells *in vitro*.⁸ Geonvinilla⁸ studied the effects of

elevated temperature on the viability of leukemic cells and found that cell death was related to the degree of temperature and the length of time at this elevated level. Cavaliere⁵ showed selective killing of neoplastic cells in relationship to normal tissue cells. His temperature range (like that of other investigators) was between 41°C and 43°C.

In vivo studies with spontaneous small animal tumors are being done at University of Arizona Health Sciences Center (AHSC). In one study a cat with a squamous cell carcinoma of the eyelid was treated with heat alone as follows: Hypodermic needles were implanted in the tumor and were used as electrodes for radio frequency heating utilizing a 500 kilohertz generator. The temperature of the tumor was raised to 42°C for 30 minutes. The lesion regressed completely and the surrounding normal tissue had no adverse response to this treatment. There had been no local recurrence of the lesion 10 months later when the animal was euthanized because of uncontrolled tumor at another site.

Overgaard⁹ studied the ultrastructure of transplanted mouse mammary tumors heated *in vivo* to 41°C - 43°C with diathermy. Biopsies were taken at various intervals and electron microscopy performed. Overgaard noted that within a few hours after treatment, lysosomal activity was prominent and the cytoplasm of the tumor cells was destroyed. Days later, nuclei were destroyed. Adjacent fibrovascular stromal cells were spared these changes. Eventually, the tumor-bearing area was replaced by fibroblasts and macrophages. One of Overgaard's conclusions was that the selective effect of heat on tumor cells may be related to their higher rate of anaerobic metabolism and, possibly, to a lower pH within the tumor.

When radiation fails to control tumor, one of the greatest reasons may be the radio-resistance of hypoxic cells. Hyperthermia is effective in killing hypoxic tumor cells. For example, Hahn¹⁰ has shown enhanced sensitivity of poorly oxygenated mammalian cells to elevated temperatures. This aspect of hyperthermia is of obvious clinical significance since the technique may provide an approach to improved control of tumors resistant to conventional local radiation therapy.

Synergism of Heat and Radiation

Synergism is present when the results of any two treatment modalities given together are greater than the added effects of either applied separately. Radiation synergism with hyperthermia has been shown.¹¹ Robinson and coworkers¹² have found that hyperthermia enhances the effect of radiation on mouse skin by a factor of at least 2 at 41°C. An even greater enhancement (by a factor of 4) was found with C3H mammary tumors heated to the same temperature. This is certainly an

From the Division of Radiation Oncology, University of Arizona Health Sciences Center, Tucson, Arizona 85724.

encouraging observation, because the effect in the tumor was at least twice that in the surrounding normal tissue. Robinson et al¹² have also found that when heat is applied to growing cells *in vitro*, the cells become more sensitive to the effects of radiation during the S (synthesis) phase of their cell cycle. Because the S phase has been the most radio-resistant, this new finding is again encouraging with regard to utilizing radiation and heat in combination for greater cell killing. Hyperthermic inhibition of repair of sublethal damage caused by radiation has also been shown. This effect is observed when low dose rates of radiation are given.¹³ We have used this finding in combining interstitial irradiation (with radium or iridium) and local hyperthermia. We have treated spontaneous tumors in dogs by inserting radium needles into the tumors and connecting the radium source to a radio frequency generator, thus simultaneously heating and irradiating the tumors. The same process has been carried out with transplantable mouse mammary tumors. Our preliminary results suggest a synergistic effect of heat with radiation.

Normal Tissue Tolerance

Radiation oncologists are ultimately limited by the tolerance of normal tissue when treating tumors in any area of the body. To obtain a favorable therapeutic ratio, the treatment must eradicate tumor while sparing normal tissue. By tailoring radiation therapy fields, we can often achieve high doses of radiation to tumors without significantly damaging normal tissue. The combination of hyperthermia and radiation almost certainly has the same difficulties. Before hyperthermia can be widely used in combination with radiation, the tolerance of normal tissues to hyperthermia must be studied. At AHSC, we are presently studying the effects of heat alone and heat plus radiation on normal skin and spinal cord. In rats, hyperthermia enhances the effect of radiation on the spinal cord.¹⁴

Physics of Heating

Many methods of heating have been utilized for studies on hyperthermia. These include hot water baths, ultrasound, diathermy, microwaves, radio frequency generators, and inhalation of heated air. At AHSC, we are presently using radio frequency generators for local and regional heating and have studied a

series of spontaneous animal tumors with this method. As mentioned before, needle electrodes are placed in and around the tumor, interconnected with metal braids, and then connected to the radio frequency generator. A fairly uniform field of hyperthermia is produced between the electrodes, with the tumor-bearing tissue functioning as a resistive load. (A thermographic camera such as that used for thermography of the breast is used for visualization of heat distribution within the treated volume.)

Much research is still necessary to improve methods of heating tissues. Currently, it is not possible to effectively heat inaccessible organs such as the pancreas except by total body hyperthermia. In the future, the various heating methods will probably be complementary, with no single method being used exclusively. The ability to accurately measure the temperature of the heated tissue is also crucial because small differences in temperature result in large differences in biologic effect. Severe normal tissue complications may occur if tissue temperature is not carefully monitored.

Clinical Application

Hyperthermia can be useful clinically only if tumoricidal doses can be tolerated by normal tissues—that is, if there is a favorable therapeutic ratio. Although there are some data from studies in small animals on the normal tissue effects of hyperthermia and radiation, there are very little data for studies in man using accurate thermal dosimetry. The Radiation Therapy Oncology Group (RTOG), a cooperative group of institutions, is planning a pilot study using local heating plus radiation for superficial metastatic tumors. At all participating institutions, a team consisting of a radiation biologist, a medical physicist, and a radiation oncologist will carry out the study. Thus, accurate dosimetry, optimal sequencing of treatment modalities, and careful measurement of tumor and normal tissue responses can be done. This kind of data is needed from a pilot project before more extensive human trials can be safely done.

As Pettigrew⁴ has shown, systemic hyperthermia is safe, and good palliative results are obtained. It appears that the anesthetized patient can be heated to temperatures from 107°F to 108°F (41.6°C to 41.8°C) and maintained at that tempera-

ture for a number of hours without any significant side effects. However, careful management of fluids and electrolytes is necessary, as well as drug management of breakdown products from malignant cells.

Other areas of interest include: 1) combining *systemic hyperthermia with local irradiation* to large tumor volumes or inaccessible sites (such as pancreas, stomach, lung, and colon lesions) and varying doses of radiation to small volumes can be utilized to obtain an estimate of the thermal enhancement ratio; and 2) combining *total body hyperthermia with total body irradiation* for such diseases as refractory lymphoma, osteosarcoma, and breast cancer.

With regard to *local irradiation combined with local hyperthermia*, head and neck tumors represent a promising area for study. It has been estimated that 35,000 patients will die annually because of failure to control their head and neck tumors locally.¹⁵ Metastatic neck nodes, as well as primary lesions—many times found in the tongue, floor of the mouth, hypopharynx, and larynx—recur after high dose radiation and even surgical intervention. These patients, as well as patients with massive unresectable neck lesions and primary lesions which cannot be eradicated by conventional radiation therapy could benefit from treatment using interstitial radiation implants and hyperthermia.

Other areas which may with improved techniques become accessible to local heating and radiation are structures such as esophagus, rectum, vagina, and cervix.

As we gain experience from clinical trials treating small superficial lesions with local hyperthermia, we can refine techniques and begin to treat larger tumor volumes. As techniques of *systemic hyperthermia* are improved, this modality should also be used in human clinical trials. With the close cooperation we have among our biologists, physicists, and clinical radiation oncologists, we are now more able to effectively treat certain tumors safely and with greatly enhanced local control rates. A multidisciplinary approach combining surgery, radiation with local heating, and systemic chemotherapy may even further enhance our abilities to control massive disease and, hopefully, eradicate all disease.

Bibliography available upon request.



CASE NO. 18

JOHN C. BJELLAND, M.D.



Figure 1

Figure 1: Admission upright abdomen examination. Distended impressions on stomach bubble.



Figure 2

Figure 2: AP view of the abdomen obtained at the termination of the barium enema study. Disreagard appearance of sigmoid colon.



Figure 3

Figure 3: Coned down LPO view of abdomen showing appearance of the terminal end of the column of barium (note arrows) in the ascending colon.

The patient is a forty-nine year old male with a three day history of acute, intermittent, cramping, right upper quadrant abdominal pain. Soon after the onset of the illness, the intensity and crampy character of the pain increased progressively and associated cyclic episodes of nausea and clear vomiting occurred.

Physical examination of the abdomen revealed a distended, tender abdomen with hyperactive bowel sounds. A tympanitic area was present in the right upper quadrant, which correlates well with the findings in *Figure 1*. No peritoneal signs were present.

The patient's significant medical history includes only the previous diagnosis of

biopsy-proven Laennec's cirrhosis. His surgical history was negative for abdominal procedures.

Due to the clinical presentation and radiological features present in *Figure 1*, an emergency barium enema was obtained. From *Figures 2* and *3*, the definitive diagnosis can be made.

CECAL VOLVULUS

The patient's history and physical examination establish the clinical diagnosis of an acute *bowel* obstruction. The radiographic findings in *Figure 1* correlate well with this and further aid in narrowing the diagnostic spectrum to include only the differential gamut of acute *colonic* obstruction. The evidence in *Figure 1*, leading to this consideration, is based on 1) the *absence* of colonic gas distal to the right upper quadrant (RUQ); 2) the *presence* of a prominent air-fluid level in a large, distended, balloon-shaped loop of colon in the RUQ; and 3) the *presence* of air filled, dilated loops of small bowel in the ileocecal region. This indicates an acute colonic obstruction is present at either the hepatic flexure or in the ascending colon.

Since the patient has never undergone abdominal surgery, it is a very remote possibility that adhesive bands could be the etiology of this problem. However, the RUQ loop of distended colon could represent a sigmoid or cecal volvulus. Due to the absence of gas in the distal two-thirds of the colon, a sigmoid volvulus can be fairly confidently ruled out. Instead, the formulation of a reasonable working diagnosis of cecal volvulus is suggested. In the absence of peritoneal signs, a barium enema was indicated to confirm the suspected diagnosis.

Figure 2 shows a poorly defined obstruction in the ascending colon. *Figure 3* is a left posterior oblique view of the ascending colon. It is the diagnostic radiograph. This projection radiographically lays out the area of stenosed luminal obstruction and specifically localizes it to the proximal ascending colon. The classic diagnostic appearance of the tapered end of the barium column, which is the roentgenographic hallmark of volvulus, is noted between the arrows in the figure.

In general, volvulus may involve almost any hollow viscus, but there is a definite propensity for its occurrence in the large bowel, chiefly in the sigmoid colon. In the evolution of a colonic volvulus, the presence of a predisposing *long* and *mobile* mesentery is nearly always a prerequisite. Thus, volvulus occurs more frequently in the mesenteric colon (*i.e.*, the "non-retroperitonealized" colon) *e.g.*, sigmoid, cecum, and only rarely the transverse colon (due to its mesentery being too short to engage in volvulus formation).

In establishing the diagnosis of cecal volvulus, demonstration of the distended cecum is essential. Classically, it is positioned in the LUQ, but (as this case demonstrates) it can be found anywhere in

the abdomen. Often, the torqued cecum inflates like a balloon to enormous proportions. When this occurs, it can greatly aid in establishing the suggestive or working plain film diagnosis.

The feared complication of volvulus is intestinal segmental vascular compromise. This can lead to bowel necrosis, perforation, and subsequent peritonitis. Therefore, if the volvulus cannot be reduced by trial of barium enema, immediate surgery is performed to correct the volvulus.

In this case, at laparotomy the cecum and proximal ascending colon had an abnormally long mesentery. This allowed

evolution of a dextrovolvulus on the cecal colonic axis. In the process, the torqued cecum then became flexed superolaterally and came to rest in a fossa in the right lobe of the liver, which was due, either to congenital focal hypoplastic segment, the patient's cirrhosis. A cecopexy was performed to prevent recurrence of the volvulus.

ACKNOWLEDGEMENT

Kindness and gratitude for his interest and assistance in preparing this case are extended to H. R. Claypool, M.D., Chief of Radiology, Veterans Administration Hospital, Tucson, Arizona.

Bibliography available upon request.



Obstetrics
and Gynecology

USE OF CORTICOSTEROIDS IN PREMATURE LABOR

JOHN KELLY, M.D.

Many of the approaches, techniques and medications used in fetal medicine are controversial. The animal model, valuable and necessary as it is, at times can only be applied with great difficulty to the human fetus, our patient. Disagreement occasionally develops between academicians and practitioners regarding the rapidity with which promising research material should be applied to clinical practice. A case in point—administration of corticosteroids to mothers in premature labor to stimulate production of surfactant by the fetal lung. This issue is examined by the author.

DONALD J. ZIEHM, M.D., Editor

Why do premature babies die of lung disease? The primary cause of death is usually their inability to maintain inflation of the alveoli. When born at or near term (> 36 - 37 weeks) that problem usually does not develop, as a group of phospholipids produced by the lungs of

the fetus maintains the surface tension around the alveoli, thereby preventing alveolar collapse.

HISTORY

Until about 1968 little could be done to decrease the frighteningly high perinatal mortality of premature infants caused by respiratory distress syndrome (RDS). Liggins in New Zealand revolutionized the care of these babies after a chance finding. While giving ACTH to sheep in a study of the cause of labor, he observed that, many of the sheep to whom ACTH had been given, prematurely delivered lambs would survive. Previously most of the premature lambs had died.

Why did these lambs survive? It was found that the surviving lambs had been born from mothers who had received ACTH. He postulated that the ACTH stimulated the production of cortisone by the maternal adrenal glands, passed from mother to fetus, and that cortisone somehow protected the premature lambs from developing lung collapse. Possibly it had something to do with surfactant production, storage, or release of surfactant to protect these newborn sheep. Because of this promising finding in animal experimentation Liggins initiated a study in humans. In a double blind study a dose

Presented at OBGYN Rounds, Maricopa County General Hospital, Phoenix on November 9, 1976.

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corticosteroid comparable to that used in sheep was administered to a group of patients in premature labor, a control group receiving a placebo. The results of this study initiated a new era in neonatal medicine. Dr. Mary Ellen Avery at Johns Hopkins, using rabbits, mice, and rats confirmed Liggins' initial studies in sheep.

The next step in the history of this phenomenon was the demonstration that receptors for specific glucocorticoids exist in the lungs (Ballard, 1973) upon which these steroids could work. Smith in 1974 showed that surfactant could be produced by lung cells in tissue culture to which steroids had been added—a laboratory demonstration that steroids could have an effect on alveoli. As a consequence of these laboratory studies, and Liggins' initial work, several medical centers have evaluated the use of steroids in women admitted in premature labor (< 34 weeks). The use of steroids in representative medical centers throughout the United States are listed in Table 1.

EFFECTIVENESS

Do steroids prevent RDS or reduce its incidence? Many studies, some double blind and some not, have shown that infants of mothers who have received cortisone during premature labor had a significantly lower incidence of RDS

can reduce the incidence of RDS, at what state of pregnancy are they most effective? According to Liggins' work, at 28 - 30 weeks gestation, even with steroid use, 28% of the infants developed RDS. Without steroids 58% were affected. With increasing age of gestation there is a much lower incidence of RDS in the treated babies (30 - 32 weeks, 8% vs 56%; 32 - 34 weeks, 0% vs 13%). Thus, the most optimal time for corticosteroid administration is at 30 - 32 weeks gestation. Neonatal mortality can be similarly reduced. In Liggins' study and studies from Israel, infants delivered following maternal steroid administration had a much lower early neonatal mortality rate (Table 3).

Are steroids helpful after 34 weeks? It has been hypothesized, with some supporting evidence, that in the normal fetus

among different steroids (Table 4). 2. The drug must not be rapidly metabolized by the mother. A moderately long-acting agent is necessary to allow time for placental transfer. 3. It must not be bound rapidly by protein in the maternal blood stream. However, it must not be such a long acting steroid that it remains at high levels in the fetus for a long period. These drugs have potential effects in other parts of the body. So a short-lived effect in the fetus is desired, just enough to create a surge of surfactant. After steroid administration, both maternal and fetal production of ACTH will be suppressed. In addition, both maternal and fetal gland participates in production of other hormones, including estrogens, by their production of precursors. A prolonged suppressing effect on endogenous pro-

Table 2.
Effectiveness of Steroids in Preventing RDS

Location	Steroids + RDS	NO Steroids + RDS	Cases
Israel	8%	38%	117
Boston	14%	56%	168
Texas	4%	36%	239
Montreal	4%	13%	855
New Zealand	11%	41%	191
Total	8%	37%	1570

Table 3
Early Neonatal Mortality With Steroid Use

	Cases	RDS	Neonatal Deaths
			Liggins
Steroids	109	11%	6%
No Steroids	82	41%	18%
All pregnancies were between 28 and 34 weeks.			
			Israel
			6%
			37%

Table 1
Use of Corticosteroids

L. A. County—USC	Yes
Harbor General Hospital	Yes
U. of Miami, U. of Florida	No
Bethesda Naval Hospital	No
U. of Calif., San Diego	No
Duke	Yes
U.C.L.A.	Yes
Univ. of Penn.	No
NIH—currently funding 5 centers	

Table 2. From these studies it can be concluded that the use of steroids can prevent or reduce the incidence of RDS.

MECHANISM OF ACTION

How do the steroids function in the fetal lung? This is still not completely clear. Alveoli consist of epithelial cells, Type I and Type II. Type I cells act in the diffusion of gasses between the lung and capillaries (which contain O₂ and CO₂). Type II cells are the cells which synthesize phospholipids into surfactant, store the surfactant in the lamellar bodies and release the surfactant into the alveolus. The lining cells of the alveolus are then coated by surfactant, reducing the surface tension on the alveolus, thereby preventing its collapse. In addition, small amounts of the phospholipid material escapes into the amniotic fluid via the trachea. Some of these phospholipids can be measured, yielding the L:S ratio. Having shown that the use of steroids

at 34-35 weeks a surge in the production of cortisol occurs which presumably then acts on the lungs stimulating surfactant production. The incidence of RDS is low in fetuses delivered after 35 - 36 weeks. Then if a patient presents in premature labor at 35 weeks is it worthwhile to administer corticosteroids? Liggins' study indicated that there was no real value in giving steroid after 34 weeks gestation (Steroids + RDS = 5.5%; No Steroids — RDS = 5.4%). However it has been suggested by some that if a patient at 35 - 36 weeks gestation has a low L:S ratio, one might be justified in administering the corticosteroid if delivery is necessary, hoping that surfactant release will be promoted. The occasional RDS seen in patients after 34 weeks might thus be avoided.

Most studies using corticosteroids have followed Liggins' original proposal in which he selected one glucocorticoid. Several general principles must be applied when evaluating the steroids. What are the criteria for selection of an appropriate glucocorticoid? 1. Affinity for receptors in fetal lungs. This varies significantly

Table 4
Relative Affinity of Various Steroids for Receptors of Human Fetal Lung

Steroid	Relative Affinity
Cortisol	100
6 σ -Methylprednisolone	1190
Fluocinolone Acetonide	1350
Dexamethasone	710
Betamethasone	540
Fluorometholone	400
9 α -Fluorocortisol	350
Prednisolone	220
Triamcinolone Acetonide	190
Corticosterone	85

duction of fetal cortisone is certainly undesirable. 4. An optimal gradient for ease of placental transfer is important. Gradients vary with different glucocorticoids (Beta-methasone 3:1, Cortisol 6:1, Prednisolone 10:1).

Partially empirically, and partly on the basis of the above criteria, Liggins chose Betamethasone for use in his studies. Relatively low dosage is required to achieve a reasonably good level in the fetus.

(To be continued)



CARBON MONOXIDE DIFFUSING CAPACITY

ROBERT J. CLARK, M.D., F.A.C.P.

This continuing series of articles entitled "Seminars in Chest Medicine" will attempt to keep the reader abreast of developments in the broad field of pulmonary diseases. The format used will be that of brief succinct reviews written by the editors as well as guest contributors. Areas of controversy as well as practical chest medicine will be explored. We hope that these reviews will be of value in promoting continuing education for certification examinations as well as a forum for new and controversial issues. The editors welcome comments and discussion from our readers.

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ABSTRACT

The carbon monoxide diffusing capacity is discussed in detail. A rational approach to its usefulness and limitations is presented. Complete derivations for the commonly used diffusing techniques are given. The diffusing capacity is a very useful measurement when used in conjunction with other pulmonary function tests especially in the detection and quantitation of early emphysema and interstitial lung disease.

In pulmonary medicine, the diffusing capacity of gases is often surrounded by a zone of confusion, as most clinicians do not recognize this capacity's clinical usefulness, its computation or its limitations. Most clinicians neither understand its derivation and limitations nor recognize its usefulness.

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HISTORY AND DEFINITION OF TERMS

The importance of diffusion of gases in the lungs was first appreciated in 1890 by Christian Bohr.¹ He made a few erroneous assumptions, but laid the foundation for his student August Krogh to place diffusion in its proper perspective.² It wasn't until 1914, however, that particular proof of the importance of diffusion alone in gas transport was offered by Marie Krogh,³ the co-worker and wife of August Krogh. The Kroghs developed elegant mathematical models for pulmonary gas diffusion and actually performed some early clinical measurements in various disease states; their results, unfortunately rest in obscurity.

For approximately 35 years, the scholarly findings of the Kroghs lay almost forgotten except for a few infrequently read studies.^{4,5} The year 1950 saw a resurgence of interest in pulmonary physiology, especially in relation to diffusion of gases. Kety extensively reviewed all previous methods for measuring the pulmonary diffusing capacity.⁶ He correctly assumed that the most useful and easily performed technique was that of Marie Krogh in 1914. At that time, she had fully developed the single breath diffusing capacity measurement as we know it today except for the addition of helium to the inspired gas.

The pulmonary diffusing capacity (D_L) measures the ability of a gas (any gas) to flow from the alveolus to the capillary. This concept appears deceptively simple but, in fact, is quite complex. D_L helps elucidate pulmonary physiology and pathophysiology. It is used to detect and quantitate certain disease states such as early emphysema and the multiple varieties of interstitial lung disease including pulmonary fibrosis, pulmonary vasculitis and obliterative alveolitis or bronchiolitis.

The physiologist could use any gas to measure D_L , but, for best clinical correlations would prefer an inert substance with a solubility and molecular weight, similar to oxygen. Its concentration and the gas should be easily measured, stable and nontoxic. Except for the toxicity, carbon monoxide (CO) meets these criteria. CO is not considered harmful in the concentrations used (0.1 - 0.3%) with short exposure. We shall refer to the pulmonary diffusing capacity hereafter as D_{LCO} .

Even in a single alveolar-capillary unit D_{LCO} is influenced by many factors. These include: 1) membrane thickness

lining the alveolus, 2) alveolar capillary protoplasm thickness, 3) capillary wall permeability, 4) thickness of plasma layer between the capillary wall and the red cell membrane, 5) reaction rate of hemoglobin with CO and O₂, 6) permeability of red cell membrane to CO, 7) presence of CO bound to hemoglobin (COHb) in blood causing a back pressure thereby decreasing CO transfer, and 8) red blood cell mass. In a system with multiple alveolar-capillary interfaces, other factors also influence the measured D_{LCO} . The additional considerations are: 1) the number of alveoli present, 2) lung volume, and 3) nonuniformity of ventilation and perfusion ratios. Therefore, when D_{LCO} is normal it can be assumed all the variables influencing the diffusion of gas through the lung are normal. If one obtains an abnormal value further investigation is needed to pinpoint the location(s) of the defect(s). Occasionally, it is useful to dissect the D_{LCO} into its components.

$$\frac{1}{D_L} = \frac{1}{D_M} + \frac{1}{\theta \cdot VC}$$
 D_M is the membrane

diffusing capacity. VC is the capillary blood volume and θ is the reaction rate of CO with hemoglobin. Rarely is this degree of sophistication needed in clinical practice.

Of the seven acceptable methods for measuring D_{LCO} , only two are widely used. The seven can be classified as single breath (SB), steady state (SS) or rebreathing (RB) techniques. The only single breath method in use today is the modified Krogh procedure.⁷ Gaensler made the collection of the appropriate gas sample an easy task with his automated single breath attachment.¹⁰ In that same paper he gave most useful equations for calculation of D_{LCO} at lung volumes other than total lung capacity (TLC). The equations are:

$$\text{Men} - D_{LCO} = 3.75 \times V_A \text{ (STPD)} - 0.153 \times \text{age} + 19.93; \text{Women} - D_{LCO} = 5.38 \times V_A \text{ (STPD)} - 0.083 \times \text{age} + 7.7$$

(V_A is the alveolar volume and STPD is the abbreviation for standard temperature and pressure of the dry gas.)

A frequent but unfounded criticism of D_{LCO} is the lack of normal values. Gaensler and McGrath^{10, 11} present a set of normal values which have both internal consistency and good clinical correlation. The modified Krogh equation is given in Appendix I. The single breath method requires the patient to hold his breath for approximately ten seconds. It requires sufficiently good pulmonary mechanics that the onset and cessation of breath holding can be accurately timed. Sensitive and reliable CO analyzers are needed as a high quality spirometer. The inspired gas contains 0.3% CO and 10% helium (He). Repeated measurements require measurement of blood CO to correct for back pressures.

The rebreathing technique (DLCO_{RB}) was introduced by Lewis in 1959.¹² It was devised to help overcome abnormalities of ventilation-perfusion imbalance. Unfortunately the measurement usually is associated with considerable hyperventilation leading to variations in alveolar oxygen tensions (P_AO₂) and carbon dioxide tensions (P_ACO₂). While some investigators find it a convenient and reliable tool but its use is not widespread.

Of the five acceptable steady state techniques only the Filley method¹³ is widely used. This procedure is simple to perform with the patient either at rest or during exercise. The subject breathes room air containing 0.1% CO for 2-3 minutes while the total expired gas volume is collected. An arterial sample for P_aCO₂ determination is also required. The Filley technique unfortunately is sensitive to ventilation-perfusion (V/Q) imbalance. As the subject's lung volume approaches total lung capacity (TLC) with the steady state testing methods, the value for DL_{SB} is attained. DL_{SB} is always greater than DL_{SS} because of the dependence of DL on the alveolar volume (V_A), except when trained subjects perform DL_{SS} at TLC. The derivation of DL_{SS} appears in Appendix II.

Other steady state methods are available but suffer either from inaccuracies based on assumptions made or from the great degree of expertise required to perform them. One may assume the alveolar CO tension from an estimated volume of dead space (V_D). Since the computed DLCO depends heavily on the actual value of V_D this method is little used. Alveolar tensions may be measured by analyzing an end tidal gas sample. This technique is plagued by the difficulties encountered in obtaining a truly representative alveolar sample in many individuals, especially during exercise. Mixed venous PCO₂ measurements have been used to circumvent the need for a blood gas analysis; however, with arterial blood gas sampling and analysis so simple and associated with low morbidity, this method is not justifiable. There is an excellent steady state technique which abolishes the effect of ventilation-perfusion abnormalities. However, since it requires a breath by breath analysis of expired gases,¹⁴ it is generally considered too difficult to perform.

USEFULNESS OF DLCO

On the other hand, DLCO is a useful technique for quantitating the extent and progression of certain disease states. It is especially useful in detecting early emphysema and interstitial pulmonary fibrosis. DLCO is decreased in congestive heart failure, drug reactions, shock, pneumonectomy, anemia, pneumothorax, pulmonary emboli, vasculitis, pneumonia and emphysema. DLCO is normal in chronic bronchitis. DLCO is increased in some forms of congenital heart disease, asthma, polycythemia and during exercise.

APPENDIX I

$$D_{LCO} = \frac{\frac{d(CO)}{dT}}{P_{ACO} - P_{CCO}}$$

F_{ACO}=alveolar fraction CO

F_{ICO}=inspired fraction CO

$$(CO) \text{ in milliliters CO gas} = F_{ACO} \times V_A \quad F_{ECO}=\text{expired fraction CO}$$

t = time in seconds

T = time in minutes

V_A = alveolar volume

Substitute

$$D_{LCO} = \frac{\frac{d(F_{ACO} \times V_A)}{dT}}{F_{ACO} (BP - 47)}$$

BP = Barometric pressure

47 = water vapor pressure in millimeters of mercury at 37 centigrade

Rearrange

$$D_{LCO} \int dT = \frac{V_A}{(BP-47)} \int \frac{d(F_{ACO})}{F_{ACO}}$$

F_EHe = fraction of expired helium

F_IHe= fraction if inspired helium

Inspired gas = 0.3% CO, 10% He, balance room air

Integrate T₀ to T₁ and F_{ACO}T₁

$$D_{LCO} \quad T \text{ (min)} = \frac{V_A}{(BP-47)} \ln \frac{F_{ACO}t}{F_{ACO}T_0}$$

$$D_{LCO} = \frac{V_A}{\frac{t(\text{sec})}{60} (BP - 47)} \ln \frac{F_{ACO}t_1}{F_{ACO}t_0} \quad \text{where } F_{ACO}t_1 = F_{ECO}$$

Because the initial breath was taken beginning at residual volume, the initial concentration of CO has been diluted by that amount. We can measure the degree

of dilution and correct for it by measuring the initial and final concentrations of helium added to the mixture. This dilution is proportional to

$$\frac{F_{EHe}}{F_{IHe}}$$

$$F_{ACO} = F_{ECO} \times \frac{F_{EHe}}{F_{IHe}}$$

At TLC, V_A approximates V_L and in most calculations V_L is used.

$$\text{Therefore, } D_{LCO} = \frac{60 V_A}{t (BP - 47)} \ln \frac{F_{ECO}}{F_{ICO}} \cdot \frac{F_{IHe}}{F_{EHe}}$$

STEADY STATE DIFFUSING CAPACITY OF FILLEY¹³

DEFINITIONS: $D_{LCO} = \frac{\text{AMOUNT OF CO TAKEN UP PER UNIT TIME}}{\text{DRIVING PRESSURE}}$

V_A = Alveolar volume P_{ECO} = expired CO pressure
 V_T = Tidal Volume P_{DCO} = dead space CO pressure
 V_D = Dead Space P_{ACO} = alveolar CO pressure
 P_{ICO} = inspired CO pressure

 $V_A + V_D = V_T$ P_{ACO_2} = alveolar CO₂ pressure
 P_{aCO_2} = arterial CO₂ pressure

We can accurately measure the amount of CO taken up as well as the time of the experiment. This leaves the measurement of P_{ACO} or the driving pressure to be calculated. We assume P_{CO} to be negligible.

$$V_A + V_D = V_T \quad \frac{V_A}{V_T} = 1 - \frac{V_D}{V_T}$$

$$P_{ECO} \times V_T = P_{DCO} \times V_D + P_{ACO}$$

Substitute $P_{DCO} = P_{ACO}$ and rearrange

$$P_{ECO} = P_{ICO} \frac{V_D}{V_T} + P_{ACO} \frac{V_A}{V_T} \quad \text{Substitute } \frac{V_A}{V_T} = 1 - \frac{V_D}{V_T}$$

$$P_{ECO} = P_{ICO} \frac{V_D}{V_T} + P_{ACO} \left(1 - \frac{V_D}{V_T}\right) \quad \text{Rearrange}$$

$$P_{ECO} = P_{ICO} + P_{ICO} \left(\frac{V_D}{V_T}\right) = P_{ACO} \quad \text{Rearrange}$$

$$\frac{P_{ECO} - P_{ICO}}{1 - \frac{V_D}{V_T}} + P_{ICO} = P_{ACO}$$

$$\frac{V_D}{V_T} = \frac{P_{aCO_2}}{P_{ECO_2}}; \quad 1 - \frac{V_D}{V_T} = \frac{P_{ECO_2}}{P_{aCO_2}}$$

$$P_{ACO} = P_{ICO} - (P_{ICO} - P_{ECO}) \times \frac{P_{aCO_2}}{P_{ECO_2}} \quad \text{Substitute and Rearrange}$$

Therefore, by measuring P_{aCO_2} and P_{ECO_2} , one can accurately determine the desired quantity, P_{ACO} .

METABOLIC ALKALOSIS

GEORGE M. NICKAS, M.D.

Extracellular fluid pH is maintained within the relatively small range of 7.3 to 7.45. The pH range with the majority of acid-base disorders is from 7.10 to 7.60. Deviations from the normal range require careful and prompt recognition and treatment. Derangement of acid-base balance occurs with a variety of pulmonary, cardiac, endocrine, renal and gastrointestinal disorders as well as therapeutic agents.

Several regulatory mechanisms control buffering of extracellular body fluids. The major system which is measured and used clinically is the bicarbonate-carbonic acid system, i.e. $H^+ + HCO_3^- \rightarrow H_2CO_3 \rightarrow H_2O + CO_2$. The extracellular buffering system is a rapidly responsive one, acting within minutes. The second major system is the pulmonary, with changes in ventilatory volume and rate mediated by central and peripheral receptors responsive to changes in arterial PCO_2 and pH. This is quantitatively the most important regulatory and excretory system for removal of hydrogen ion. This, too, is a rapidly responsive system acting within minutes. The third regulatory system is renal, which responds relatively slowly, acting within hours to days, and is quantitatively less important than the ventilatory mechanism but still critical in maintaining pH balance.

Four pure types of acid-base imbalance are well recognized although mixed types are relatively common; respiratory acidosis and alkalosis and metabolic acidosis and alkalosis. Respiratory disorders are characterized by primary changes in alveolar ventilation with resultant changes in arterial PCO_2 : (a) respiratory acidosis by hypoventilation, a rise in arterial PCO_2 and decrease in pH due to primary pulmonary disorders; (b) respiratory alkalosis by hyperventilation, decrease in arterial PCO_2 and rise in pH due to a variety of unrelated disorders. The respiratory acid-base disorders will not be considered further. The metabolic acid-base disorders are characterized by primary changes in plasma bicarbonate levels. Metabolic acidosis will be considered in a subsequent discussion.

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Pure metabolic alkalosis is characterized by (1) elevation of plasma bicarbonate levels, (2) elevation of arterial pH, (3) hypochloremia and (4) variable degrees of hypokalemia. The most important stimuli for the production of metabolic alkalosis are extracellular volume contraction usually associated with chloride depletion, potassium depletion, and mineralocorticoid excess. Conditions leading to metabolic alkalosis are shown in Tables 1 and 2. It is useful to divide causes into two major groups, (a) those typified by low urinary chloride concentrations, that is, less than 10 mEq per liter and responding to sodium chloride (saline) replacement and (b) those with high urine chloride concentration greater than 10-20 mEq per liter and resistant to correction with sodium chloride (saline) replacement. The predisposing conditions listed in Table 1 are the most commonly

CAUSES OF METABOLIC ALKALOSIS

Chloride responsive — low urine chloride concentration.

1. Gastrointestinal
 - (a). Gastric suction.
 - (b). Villous adenoma.
 - (c). Congenital chloride-losing diarrhea (congenital alkalosis).
2. Diuretic administration
 - (a). Organo-mercurials.
 - (b). Thiazides.
 - (c). Ethacrynic acid.
 - (d). Furosemide.
 - (e). Metolazone (Zaroxolyn).
3. Post-hypercapneic alkalosis

Table 1

encountered in clinical practice. Alkalosis due to gastrointestinal fluid losses and diuretic usage is associated with contraction of the extracellular space, chloride depletion, and usually potassium depletion. Saline administration can correct gastric juice loss alkalosis alone. With more severe degrees of alkalosis, potassium replacement is necessary since potassium deficits are common and may be of the order of several hundred milliequivalents. Acidifying salts such as intravenous ammonium chloride or 10% arginine hydrochloride may be useful in the more severe disorders. The latter can be given as a 10% solution furnishing 47.5 mEq of hydrogen chloride per 100 ml. Ammonium chloride is useful but may be limited by the appearance of encephalopathy. Monitoring of serum electrolytes is valuable in assessing adequacy of therapy in correction of the alkalosis. Increase in the urinary chloride concentration to normal values is indicative of adequacy of chloride replacement.

Diuretic-induced alkalosis is commonly seen with extracellular volume contraction or marked potassium depletion or both. Triamterene and spironolactone are important exceptions to the above observation. Cautious volume expansion

with water and sodium chloride may be corrective despite the presence of advanced cardiac or renal decompensation. Potassium chloride replacement alone will often suffice to adequately correct diuretic-induced alkalosis when volume or salt replacement is contraindicated.

Post-hypercapneic alkalosis may be seen with severe chronic respiratory acidosis when the existing hypercapnia is rapidly corrected by mechanical ventilation. In this situation arterial PCO₂ may drop abruptly with a rapid change in arterial pH to an alkalemic range. Bicarbonate diuresis with decrease in plasma bicarbonate level will occur but requires several hours to days, lagging well behind the abrupt decrease in PCO₂. The bicarbonate diuresis is accompanied by potassium urinary loss and occurs independently of body chloride balance; however this potentially severe post-hypercapneic alkalosis can be avoided by more gradual lowering of arterial PCO₂, saline or sodium chloride replacement and use of acidifying drugs such as ammonium chloride or acetazolamide (Diamox).

Table 2 lists the less commonly

B. Chloride resistant — high urine chloride concentration

1. Bicarbonate administration
2. Primary reninism (renin secreting tumors).
3. Bartter's syndrome.
4. Endocrine disorders.
 - (a). Primary aldosteronism.
 - (b). Cushing's syndrome.
 - (c). Ectopic ACTH producing tumor.
5. Licorice ingestion.
6. Severe potassium depletion.
 - (a). Chronic diarrhea.
 - (b). ? laxative abuse.
 - (c). Penicillin G, Carbenicillin use.

Table 2

encountered causes of metabolic alkalosis. This group is characterized by resistance to correction by saline (sodium chloride) and by a high urinary chloride concentration, i.e., greater than 10-20 mEq per liter. In most of this group extracellular volume is not contracted and may in fact be expanded, for example, mineralocorticoid excess. Therapy must be directed at the primary disorder for eventual control of the metabolic alkalosis. The use of excessive bicarbonate is self explanatory and requires discontinuation of that agent. The alkalotic effect of licorice ingestion results from the corticosteroid effect of glycyrrhizic acid inducing sodium water retention, potassium depletion as well as hypertension, edema, and kaliopenix myopathy. Glycyrrhetic acid, a component of glycyrrhizic acid, has a structural formula closely resembling the corticosteroids. Discontinuation of licorice and potassium replacement are indicated.

Recently, renin-secreting tumors have been implicated as a cause of hypertension, secondary aldosteronism, hypoka-

lemia alkalosis with marked hyperreninemia. Most of these tumors have been identified as justa-glomerular cell renal tumors although Wilm's tumors and tumor of the lung have also been observed to produce hyperreninemia. The JG cell tumors tend to be small requiring careful renal arteriography for identification with the finding of elevated vein renin from the involved kidney. Treatment is primarily surgical.

Bartter's syndrome is characterized by justa-glomerular apparatus hyperplasia, hyperreninemia and hyperaldosteronism, normotension and hypokalemia alkalosis. The patho-physiology remains to be completely elucidated; however defective chloride ion reabsorption in the ascending limb of the loop of Henle with increased sodium-potassium exchange distally and chloride wasting has been suggested. Potassium chloride supplement alone is of transient benefit in correcting the alkalosis but large doses of spiro lactone (400 mg. per day) with high sodium intake have been reported of benefit in correcting the potassium wasting and hyperreninemia in this disorder.

A variety of endocrine disorders as indicated in Table 2 may produce metabolic alkalosis due to mineralocorticoid excess. The most commonly implicated corticoids are aldosterone, corticosterone and deoxycorticosterone. The presence of hypokalemic metabolic alkalosis in hypertension should alert one to the possibility of mineralocorticoid excess. It should be noted also that ectopic ACTH-producing tumors are capable of producing metabolic alkalosis.

Finally, there should be mentioned the relatively rare disorders that are seen with profound potassium depletion and alkalosis which is resistant to saline replacement. Here serum potassium is usually 2.0 mEq per liter or less, urinary chloride concentration is relatively high, much greater than 20 mEq per liter and a chronic diarrheal state is present. The latter may be due to laxative abuse, intestinal fistulas and ulcerative colitis. Total body potassium deficits may be pronounced, 400-1000 mEq, requiring replacement in addition to saline or salt replenishment in order to correct the alkalosis. This group of severely hypokalemic saline resistant patients have also been described as having "chloride wasting nephropathy".

Penicillin G and carbenicillin are rare causes of severe hypokalemic metabolic alkalosis. Penicillin may act as a nonresorbable anion increasing distal tubular potassium exchange and enhancing urinary excretion. The potassium deficits reported with carbenicillin (640 mEq) in the absence of other causes for hypokalemia is consistent with that chemical mechanism.

Bibliography available upon request.



DIABETIC CONTROL:

Is the Controversy Over?

ROBERT GANELIN, M.D.

Continuing with the present issue of *Arizona Medicine* is the series of articles entitled "Seminars in Endocrinology and Metabolism." The purpose of these short review articles is twofold. First, due to the rapid proliferation of new knowledge in the field of endocrinology and the multiple tests available for their evaluation, short, clinically oriented reviews would enable the physician to keep abreast of these newer developments as they relate to their practice. In addition, with great stress being placed on voluntary recertification in many subspecialties, reviews such as they could serve as an authoritative, succinct teaching forum. The editors will endeavor to accomplish these goals by utilizing the talents of practicing physicians as guest contributors to this series. Feedback, both positive and negative, is encouraged in order to help us fulfill these objectives.

MARSHALL B. BLOCK, M.D., EDITOR

The American Diabetes Association, in a policy statement (*Arizona Medicine*, June, 1976, p. 473-474) indicated that the weight of evidence, particularly of the past five years, strongly supports the concept that the micro-vascular complications of diabetes are decreased by reduction of blood sugar.¹

It is the contention of the writer that this statement which has received widespread publication² places the onus on practicing physicians to attempt a program of management the benefits of which are incompletely defined, the tools for which are not available, and the physical and emotional consequences of

which can easily be as devastating as the microvascular complications. The purpose of this communication is to explain this concern and to pray that the American Diabetes Association statement be placed in proper perspective in terms of practicality and all long term effects.

Is the relationship between "control" of blood sugar and microvascular complications adequately defined?

The answer to this question is no. The accumulating information certainly suggests a relationship between blood sugar and microangiopathy.³ However, there is no information documenting the preciseness of the relationship. Drash,⁴ in a recent editorial, stated, "it is not difficult to accept accumulating evidence that the multitude of metabolic and endocrine alterations associated with insulin deficiency are intimately related to the progression of vascular disease. Stated another way, evidence is lacking that if we could move patients from 'fair' to 'good' metabolic control substantial benefits would necessarily follow."

Since selection of a therapeutic regimen demands consideration of risk-benefit relationships, one must be cautious in attempting "tight" control of blood sugar at any cost until the benefits are more specifically defined.

Is it practical to maintain a steady or optimal blood sugar level in the insulin dependent diabetic?

The answer, with certain exceptions, is again "no". The problems of controlling blood sugar are numerous and well documented.⁵ A brief list of the impediments to achieving the steady state follows:

1. Diabetics in all socio-economic groups and despite educational programs, make numerous mistakes in carrying out prescribed regimens. In one study, the number of errors increased with socio-economic status, amount of education, and duration of diabetes.⁶

2. Testing of periodic urine samples is an inadequate means of determining blood sugars.^{7,8}

3. Occasional blood sugars are meaningless in determining the total daily pattern of blood sugar.^{8,9}

4. The variability in activity and, hence, metabolic needs of the juvenile diabetic defies the attainment of a steady metabolic state.^{4,9}

5. Resistance to regimentation, a characteristic of childhood and adolescence (if not of humanity in general) further cripples any attempt to achieve conformity.¹⁰ The difficulty of maintaining

the steady state is acknowledged in the American Diabetes Association statement which says, "it is well appreciated, however, that in some juvenile-onset subjects, it is most difficult, even with multiple insulin injections, to achieve a significant degree of control of hyperglycemia." Further . . . "current means of therapy are only partly effective at best, and therefore a high priority must be assigned to the development of more physiologic insulin delivery systems or approaches to the correction of the deficient insulin-producing mechanism itself."

What are the physical and emotional consequences of striving for the steady state of the blood sugar?

Probably the greatest hazard of "tight" control of blood sugar is hypoglycemia. This is presumably a problem especially for juvenile diabetics because of their extremely variable activity patterns, resistance to regimented eating patterns, and lack of recognition of the early, of subtle signs of hypoglycemia. Hypoglycemia in diabetics, either overt or covert, has been associated with impaired intellectual function,¹² seizures, and chronic brain syndromes.¹³

The other frequent but often unrecognized physical consequence is the Somoogy reaction or post-hypoglycemic-hyperglycemia.^{9,14} Rohr and McLaren¹⁵ list hypoglycemia as one of the prominent causes of ketoacidosis in childhood. The incidence of these syndromes in the tightly controlled diabetic cannot be stated, but it seems, both on the basis of logic and personal observation, that greater regimentation is associated with an increased occurrence.

One can speak more eloquently of emotional problems associated with regimentation. The failure of programs devoted to alteration or regimentation of life style is well recognized whether one is trying to affect diabetic control, obesity, alcoholism, cigarette smoking, and so on. It seems only logical that if programs of control in well motivated adults are associated with almost universal failure, one can expect less success when one imposes controls on the unmotivated, uncompensating child. It is the writer's content that the problems of rebellion by juvenile diabetics against their disease are a result of the rigid imposition of a set, illogical (to the child) controls, heavily laced with morality and threats of sanctions for non-compliance. The inescapable results of this approach are further non-compliance, negativism, rebellion

d the establishment of a life pattern which makes one distrustful of authority.¹⁰ What can this communication accomplish? Certainly the above comments will not persuade the clinician who believes in living for the steady state to alter his approach. However, it is felt that some protest must be made to the establishment of a "party line" for diabetic control. The writer has already been approached by two of his colleagues who have said, in effect, "Well, what are you going to do about our diabetics now", as if to say that the issue of "control" is now resolved. It is this type of pressure, justified by the aura of authority of the American Diabetes Association statement and its widespread publication, which can lead the novice diabetician or the primary care physician to the conclusion that there is no other method of management.

I contend again, that although "optimal" regulations of blood glucose levels" could be a logical, *ideal* goal, the mounting of a crusade to control blood sugar with our present tools is inappropriate and perhaps even dangerous.

Instead an achievable set of goals for diabetic control are recommended.

1. Freedom from symptoms of hyperglycemia, i.e., no polyuria (0-1 time nocturia) and "normal" appetite for the patient.

2. Complete freedom from hypoglycemia.

3. A steady growth pattern in the child, maintenance of stable weight in the adult.

4. Good general health, including a positive emotional outlook toward life and the patient's diabetes.

Bibliography available upon request.

Editor's note: This well-reasoned communication by Dr. Ganelin represents his own feelings concerning children with diabetes mellitus. The editor agrees with Dr. Ganelin that tight control of diabetes mellitus is probably the IDEAL way to treat the disorder. The editor believes that individualization of diabetic control should be accomplished by taking into account all the factors which Dr. Ganelin raises, as some patients can be tightly controlled without adverse effects while others would be severely hampered. The editor feels it is possible that loose control may lead to increased microvascular complications later in life. Therefore, so that it is prudent to avoid loose control. For this reason, intermediate position is favored by the editor. MBB



SALT AND ESSENTIAL HYPERTENSION

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ABSTRACT

Epidemiologic studies of the distribution of hypertension, physiologic studies of its production, and pharmacologic investigations of its control all suggest that high dietary intake of sodium is the major cause of essential hypertension in this country.

Some of the data which have led many investigators to conclude that excessive consumption of sodium is the major basis for the high incidence of essential hypertension in developed countries is assembled in this paper.¹⁻³ Surveys in many countries have shown that individuals living in societies with high dietary sodium intakes tend to develop hypertension as they age.⁴ This is not observed in societies with low sodium intakes (Table 1). Examination of societies with

Table I	
SALT AND HYPERTENSION ¹	
Societies	Increase in systolic BP from 3rd to 7th decade
5 with mean dietary NaCl of 7.5 g/d or more	all 30 mm Hg or more
3 societies with mean dietary NaCl intake of 2 g/d or less	all 2 mm Hg or less

similar racial backgrounds have also shown that high dietary sodium intake is

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associated with an increased incidence of hypertension with aging, a process much less marked in those with lower sodium intake^{5,6} (Tables 2 and 3). However, these epidemiological observations do not prove that excessive sodium intake causes hypertension. Societies characterized by low sodium intake are uniformly primitive, undeveloped, and rural and differ from developed high-sodium societies in many respects other than their intake of their dietary sodium.

Table 2
RELATION OF BP TO SODIUM INTAKE IN 2 POLYNESIAN POPULATIONS LIVING IN THE COOK ISLANDS (DATA PRESENTED ONLY FOR WOMEN)⁵

Populations	Ur Na (meq/d)	Age (Yrs.)	Mean Diast. BP
Rural (Pukapuka Atol)	63	20-29	71.4
		60-69	80.3
Town (on Rarotonga Island)	102	20-29	77.6
		60-69	102.3

Table 3
DATA ON ADULTS IN 6 MELANESIAN SOCIETIES LIVING ON 2 OF THE SOLOMON ISLANDS⁶

	Na intake meq/d	% with BP > 140/90
3 acculturated societies	50-230	4
3 unacculturated societies	10-30	0.5

The therapeutic effectiveness of sodium restriction in the treatment of hypertension has been recognized by certain physicians for many years but did not gain wide recognition in this country until the 1944 report of Walter Kempner, working at Duke University.⁷ Kempner found that a diet composed exclusively of rice and stewed fruit was valuable in the control of hypertension. Confirmation of the effec-

tiveness of this diet came from many sources. Murphy,⁸ also working at Duke University, observed that the diet reduced extracellular and plasma volumes as well as blood pressure in hypertensive patients (Table 4). Watkin's and his co-workers⁹ in

Table 4

MURPHY'S EXAMINATION OF THE RICE DIET⁸

Content: Rice & Fruit, 2,000 cal. with fat < 5 g, protein \pm 20 g, carbohydrate \pm 450 g, Na+ < 10 meq per day.

Before	After 14 wks. on diet
Diast. BP 15 15 had 100 or > (110 or > in 11 15)	by at least 20 mm Hg or to < 95 in 9 15
Plasma vol.	-10.2%
ECF	-11.8%

New York, also found that the rice diet was remarkably effective in managing severe hypertension. They were able to show by addition and substitution that the essential ingredient in the diet was not the use of rice as the major carbohydrate and not the restriction of proteins and fats but rather the limitation of sodium intake (Table 5). The effectiveness of the rice diet in the control of hypertension was

Table 5

WATKINS ET AL. EVALUATION OF RICE DIET IN 50 HOSPITALIZED PATIENTS⁹

Mean BP after 7-10 weeks on control diet 196 112
Mean BP after 7-10 weeks on < 10 meq Na d 167 96
3 g NaCl d added to low salt diet usually caused high blood pressure
Other carbohydrates, protein & fat did not produce hypertension if sodium free.

sometimes abolished by daily addition of as little as 1 g of NaCl to the diet and usually was abolished when 3 g of NaCl were added.⁹ The rice diet as initially described provided about 10 mEq of sodium (equivalent to 0.6g of NaCl) per day. The rice diet is usually described as being severely restricted in sodium. This statement is justified when the rice diet is contrasted with our usual diet; however, we should stop confusing "normal" with "usual". Conceivably, humans are designed to live on diets containing only small amounts of sodium. It might be healthier to think of our usual diet as containing an excessive amount of sodium while the sodium content of the rice diet would more closely approximate normal.

A high proportion of patients with essential hypertension in this country are overweight.¹⁰ Weight reduction has been advised as one way of managing hypertension. Dahl examined the effectiveness of caloric restriction in contrast to

sodium restriction in the management of hypertension in obese subjects.¹¹ Caloric restriction without sodium restriction was rarely effective in reducing blood pressures in hypertensives, while sodium restriction without caloric restriction was uniformly effective in his experience (Table 6). In order to secure tight control over the intake of calories and sodium Dahl's patients had to be studied during prolonged hospitalization.

Table 6

EFFECT OF DRASTIC CALORIC RESTRICTION AND WEIGHT LOSS OR DRASTIC Na RESTRICTION ON BP IN HYPERTENSIVE OBESE PATIENTS¹¹

Caloric restriction, no Na restriction	6 7 had no significant \downarrow in BP (1 7 lost 93K and became normotensive)
Na restriction, no caloric restriction	7 7 became normotensive (diastolic BP < 95mm Hg)

An appreciation of renal handling of sodium in response to blood pressure change is necessary in understanding the physiology of sodium's postulated role in the production of hypertension. Selkurt,¹² studying isolated, perfused dog kidneys found that changes in blood pressure, even with little change in glomerular filtration rate or renal blood flow, caused marked changes in sodium and water excretion. A decrease in blood pressure with a decrease in the glomerular filtration rate of as little as 7% led to a decrease in urinary sodium excretion by as much as 50%. Increases in blood pressure so modest that no change in glomerular filtration rate could be detected could lead to marked increases in sodium excretion. Borst¹³ in 1963, updated and summarized earlier theories on blood pressure control as determined by salt intake and extracellular fluid volume (Table 7). To examine this theory human volunteers were given large amounts of a

Table 7

STARLINGS' THEORY ON THE RELATION OF FLUID BALANCE AND CIRCULATION OF THE BLOOD (1909). UPDATED BY BORST (1963)¹³

\uparrow ECF \rightarrow \uparrow central venous pressure \rightarrow \uparrow cardiac output \rightarrow \uparrow BP \rightarrow \uparrow renal Na+ excretion & \downarrow ECF

licorice extract containing a substance with mineralocorticoid-like properties. As predicted by the theory outlined in Table 7, administration of this material resulted in hypertension. The blood pressure remained elevated during continued licorice administration. Initially sodium was retained and there was a rise in body weight presumably attributable to expansion of the extracellular fluid volume. Central venous pressure also rose. Cardiac

output was not measured. As administration of the licorice extract was continued there was some compensatory correction (decrease) of the expanded extracellular fluid volume. Discontinuation of licorice extract administration resulted in reversion of all measurements toward normal. Other investigators studying rats found that hypertension could be induced by unilateral nephrectomy and partial occlusion of the contralateral renal artery (Table 8). Following this procedure some of the rats did not become hypertensive; however,

Table 8

RATS SUBJECTED TO UNILATERAL NEPHRECTOMY AND PARTIAL OCCLUSION OF THE CONTRALATERAL RENAL ARTERY¹⁴

1 2 of rats remained normotensive and had normal cardiac outputs (CO)
1 2 of rats developed hypertension and had a transient (0-10 day) increase in CO

predicted by Borst's theory (Table 7) hypertension in the rats who did become hypertensive, was preceded by a period of increased cardiac output. Guyton and his co-workers¹⁵ have modernized and elaborately developed a similar theory of blood pressure control which is summarized briefly in Table 9.

Table 9

GUYTON'S THEORY¹⁵

\uparrow ECF and plasma volume \rightarrow \uparrow cardiac output \rightarrow \uparrow flow in tissue \rightarrow autoregulation with \downarrow flow and \uparrow BP \rightarrow \uparrow renal Na+ excretion \rightarrow \uparrow ECF and plasma volume

There are many animal studies supporting Guyton's theory (Table 9). Dahl, studying six colonies of rats maintained on different NaCl intakes for one year found a striking correlation between the mean systolic blood pressure in each colony of rats and their mean daily sodium intake. These rats, like many other populations of animals, showed a marked individual variability. Some rats in a single colony developed hypertension that led to their death within a few months while others in the same colony eating the same amount of sodium chloride had little or no change in their blood pressure. Dahl,³ by selectively inbreeding the rats that were relatively prone and relatively resistant to sodium loading, found that after five to seven generations they could produce rats with median blood pressures as low as 123 mm of Hg in the strain resistant to sodium loading while in the strain sensitive to sodium the median blood pressures were 216 mm of Hg.

In addition to the feedback loop shown in Table 9 illustrating a major blood pressure control system, sodium administration may change blood pressure

er vascular reactivity to vasoconstrictors.¹⁶ Rats fed diets of varying sodium content for 8 weeks have variable responses to administration of angiotensin II. Angiotensin II administration causes a greater than expected rise in blood pressure in animals given low sodium diets while animals given high sodium diets have an impaired responsiveness to angiotensin II (Table 10).

Table 10 RATS FED DIETS OF VARYING Na+ CONTENT FOR 8 WEEKS ¹⁶		
Diet	Resting BP	BP response to AII
Control	no change	control
Low Na+	no change	↓ 33%
High Na+	no change	↑ 43%

Progressive reduction of renal mass by partial nephrectomy progressively impairs sodium excretion and in response to a constant sodium intake should be associated with a rise in blood pressure. This prediction based on the theory outlined in Table 9 has been validated in rats¹⁷ (Table 11) and in dogs¹⁸ (Table 12). The blood pressure change induced by partial nephrectomy in salt loaded dogs is

Table 11 RENAL MASS AND HYPERTENSION IN RATS ¹⁷		
Reduction of renal mass partial nephrectomy	Salt loading	Incidence of hypertension
50%	0	18%
75%	0	56%
75%	+	100%

Table 12 EFFECTS OF Na LOADING ON BLOOD VOLUME AND Na SPACE IN DOGS AFTER REMOVING 70% OF THEIR KIDNEYS ¹⁸		
	Changes	
Mean	Transient	Sustained
BP	↑ 26%	↑ 31%
Blood Vol.	↑ 19.8%	none
Na space	↑ 16%	none

sustained while the extracellular and blood volume changes were more apparent acutely than on a chronic basis (Table 12). If most hypertension were attributable to consumption of amounts of salt in excess of our excretory power (at normal blood pressures), one would expect that administration of diuretic agents would be associated with a decrease in extracellular and plasma volume. This expectation has been confirmed in humans¹⁹ (Table 13). However, the data on dogs displayed in Table 12 would lead one to expect that on a chronic basis compensatory changes might obscure alterations in extracellular and plasma volumes. The chronic changes reported in plasma volume after treatment of hypertensive humans with thiazides

diuretics are small and not always significantly altered from the control; however, there is a uniform tendency for these volumes to decrease (Table 13).

Table 13
CHANGES IN PLASMA VOLUME AFTER 1 MO TREATMENT WITH THIAZIDES¹⁹

Study	#Pts.	Change (L) in plasma vol.	p
A	11	-0.08	< 0.1
B	11	-0.15	< 0.05
C	10	-0.09	> 0.2
D	11	-0.05	> 0.4
E	16	-0.04	> 0.4
F	18	-0.15	< 0.05
G	11	-0.24	< 0.005
Present	7	-0.13	< 0.1

Discontinuation of chronic thiazide treatment of essential hypertension would be expected to be associated with some increase in plasma and extracellular fluid volume. This expectation has been confirmed²⁰ (Table 14). Investigators at the Cleveland Clinic²¹ studying a group of 14 hypertensive patients, 13 of whom were

Table 14
EFFECT OF DISCONTINUING CHRONIC THIAZIDE TREATMENT IN ESSENTIAL HYPERTENSION²⁰

	Change (L) after 4 weeks
Plasma vol.	+ 0.30
Extracellular fluid	+ 1.42

characterized as having their hypertension well controlled on thiazide diuretics alone, found a high correlation between plasma volume and blood pressure when the patients were on a sodium restricted diet alone, when they were on a high sodium diet and when they were at home taking thiazide diuretics (Table 15). If thiazides are effective in hypertension control by

Table 15
CORRELATION OF PLASMA VOLUME & BP IN 14 PATIENTS WITH ESSENTIAL HYPERTENSION²¹

Treatment	r
9 meq Na d for 4 days	+0.58
Above + 262 meq Na d IV for 2 days for 70 K pts.	+0.59
Usual home diet + hydrochlorothiazide or spironolactone or both for years	+0.61

acting as sodium diuretics it should be possible to abolish their effects by administration of sodium salts in addition to the diuretics. Administration of 20 g of NaCl a day in addition to that in the usual diet has been found to abolish the antihypertensive effect of 1 g of

chlorothiazide a day in hypertensive patients previously controlled with this drug.²² Thiazides, in addition to decreasing extracellular fluid volume and decreasing, thereby, the stimulus to increased blood pressure outlined in Table 9, also cause a reduction in responsiveness of blood pressure to norepinephrine²³ (Table 16). This effect of thiazides on hypertension can be abolished by expansion of intravascular volume (Table 16).

Table 16
HOW DO THIAZIDES ALTER BP?²³

Chlorothiazide 1.5g d x 3 given to normotensive volunteers
Response of BP to IV norepinephrine
before treatment: ↑ 35%
after treatment: ↑ 20%
600 ml 6% dextan IV abolishes the impaired responsiveness after chlorothiazide

If excessive sodium intake and expansion of extracellular fluid volume produce hypertension as illustrated in Table 9, one would predict that drugs which lower blood pressure by some mechanism other than through sodium diuresis would cause sodium retention with expansion of extracellular fluid volume. This expectation has been confirmed²⁴ (Table 17). Two weeks after starting treatment of hyper-

Table 17
MEAN CHANGES AFTER 2 WEEKS OF TREATMENT WITH METHYLDOPA 0.5 - 1.0 g qd²⁴

	Change	p
Blood volume	+ 8%	< 0.001
Exchangeable Na	+ 2%	> 0.2
Body weight	+0.5K	> 0.05
BP	-32 18	< 0.001

tensive patients with methyldopa, blood pressure is lowered but at the same time there is an appreciable increase in blood volume. One might predict that if this compensatory increase in blood volume were large enough, it might decrease or even abolish the antihypertensive effect of methyldopa in a sequence of events operating as outlined Table 9. For years physicians caring for hypertensives have noticed that prolonged administration of drugs lowering blood pressure by altering the activity of the autonomic nervous system can be associated with increasing refractoriness to the drugs.²⁵ This outcome is an expected consequence of untreated expansion of extracellular and plasma volume and can be treated with administration of diuretics.

If excessive sodium intake were responsible for the current epidemic of hypertension, is this information of practical value? Even though marked sodium restriction is effective in controlling hypertension, the notion of getting

an appreciable portion of our population to restrict drastically sodium intake is, at least to me, inconceivable. Is modest sodium restriction of value? In my examination of the medical literature I know of only one prospective examination of this question.² Twenty two hypertensive patients taking no anti-hypertensive drugs were studied for one month while taking their usual diet and for one month while taking a diet containing about one half the usual amount of sodium (Table 18). Mild salt restriction was effective in decreasing blood pressure. As a rough generalization one can say that hypertensive patients can lower their systolic pressure by 2 mm of mercury and their diastolic by 1 mm of mercury for every g of NaCl they do not eat.

Patients instructed in dietary sodium restriction are often given long tables of

Table 18

EFFECT OF MODERATE Na RESTRICTION ON HYPERTENSION²

22 hypertensives taking no drugs were each studied for 1 month on both diets.

Treatment	Ur Na meq/d	Change in BP
Usual diet	191	0 0
Moderate Na restriction	93	7.7 4.4

information on the sodium content of food. In the days before effective oral

diuretics were available, many physicians found very poor results using advice on sodium restriction as a technique for managing salt intake in patients. Dahl³ pointed out that advice on sodium restriction could be extremely simple (Table 19). A sodium intake of 17 mEq per day (equivalent to 1 g of NaCl) can be achieved by patients following Dahl's advice. Unfortunately, like much good advice, it is simple to give but difficult to follow. In Table 20 the sodium content, expressed as grams of NaCl, is listed for some common foods. The salt content in the components of what might be a breakfast menu are indicated in the top 4 items in Table 20. Even if no salt were added at the table the sodium content of that breakfast alone would exceed the

Table 19

DAHLS' ADVICE ON Na⁺ RESTRICTION³

If you follow Dahls' advice on Na⁺ and add no Na⁺ to food
use no processed foods
avoid milk and milk products

Na⁺ intake will be about 17 meq/day, i.e., the amount of Na⁺ in 1 g NaCl

entire daily sodium content of a diet markedly restricted in sodium. Prepared meats have enormous amounts of salt as indicated in Table 20. The high salt content of canned goods is generally

recognized but some do not realize that in the preparation of frozen foods brine often used to separate good from bad vegetables and can account for a appreciable content of salt in certain frozen vegetables (Table 20).

The weight of the evidence suggests that the high consumption of sodium is the major basis for our high incidence of essential hypertension. Although I think we can use this information in advice on health maintenance and in the management of patients with hypertension we must continue to keep in mind that it is a postulate. I know of no prospective study which has examined the role of sodium in the production of hypertension in a large population.

Table 20

SODIUM CONTENT OF COMMON FOODS (DATA FROM AYERST LABORATORIES)

Foods	Sodium content expressed as g of NaCl
Bacon, 2 strips (2 oz.)	0.36
Bread, white, 2 slices	0.59
Butter, 2 pats	0.35
Milk, 1 cup	0.32
Ham, cured, 1-4 lb.	1.3
Beans, lima, canned 1/2 cup	0.69
Beans, lima, frozen, 1 1/2 cup	0.26

Bibliography available upon request.



*Seminars in
Gastroenterology
and Liver Disease*

THE GUT AND IMMUNOLOGY

Our current understanding of gastrointestinal and liver diseases has been enhanced by advances in the field of immunology. In order to highlight this information a review of immunology as it relates to gastroenterology will be undertaken.

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There appears to be three varieties of interrelated immunological reactions which can take place in the body. The classic immediate hypersensitivity reactions which are responsible for the anaphylactic-type reactions are mediated

by antibodies classified as immunoglobulin E. These reactions clinically start within minutes and last for up to an hour. Another form of immune reaction usually occurs four to six hours after an antigenic challenge and are called Arthus-type reactions. These are due to antigen-antibody complexes being precipitated in tissues. The last variety are known as delayed hypersensitivity reactions which take one to two days to evolve and may persist for a prolonged period. This variety is mediated by mononuclear cells and is therefore known as the cell-mediated immunity. Involvement of each of these possible pathophysiologic processes within the gastrointestinal tract occurs under different circumstances. The cells involved in antibody production are thought to be derived in the human from the combined areas of Peyer's patches,

appendix and the sacculus rotundus possibly the equivalent of the Bursa of Fabricius which is responsible for "B" cell production in the chicken. These cells are responsible for immunoglobulin production both within the gastrointestinal tract and systemically. The cells which mediate delayed type hypersensitivity reactions are thought to be derived from contact with the thymus gland and are thus called "T cells". They are located in the mucosa submucosa and lamina propria of the gastrointestinal tract. Thus, immune globulin and cell-mediated responses to antigens entering the body via small breaks in the mucosal surface of the gastrointestinal tract occur by the joint participating of local and systemic cellular immune involvement. Additionally, there seems to be division of labor within the body concerning the production of various

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ds of immunoglobulins. Systemic lymphocytes seem to synthesize predominantly immunoglobulin G (IgA). IgA is found in nasal, salivary gland, bronchial, stomach and intestinal secretions and may provide a protective barrier for the mucosa. It has been discovered that this molecule is combined with a "transfer protein" which is synthesized by the mucosal cells. In addition to some structural differences between the IgA immunoglobulin made within the intestinal tract and that found in the serum there appears to be additional biochemical difference between these molecules. Serum IgA does not fix complement. This has been demonstrated by the oral polio inoculation program which has shown that complement-binding antibodies to polio virus is produced only with the oral exposure and not parenterally. It appears that the IgA protein is actively secreted from the cells of the gastrointestinal tract to the lumen. There is little evidence that the systemically produced immunoglobulins (IgG, IgA and IgM) are actively secreted across the mucosal epithelium. If these proteins can gain access to the gastrointestinal lumen by cellular desquamation, lymph leakage or cellular inflammation. This accounts for the hypogammaglobulinemia which sometimes occurs in various forms of protein-losing enteropathies.

Clinically, there are conditions associated with deficiencies of this immune system. Diarrhea and malabsorption are the most common symptoms of patients with immunological deficiencies. The etiology of malabsorption associated with deficiency of these immunoglobulins is not known. It is possible that bacterial overgrowth, proliferation of *Giardia lamblia* within the duodenal region of the small bowel or malassimilation of fats caused by bile salts being deconjugated may be responsible for these clinical findings. It is usually a deficiency of IgA which is found in these conditions. Conditions associated with IgA deficiency include primary agammaglobulinemia, various protein-losing enteropathies (Whipple's disease, celiac sprue, etc.), ataxia telangiectasis, gastrointestinal heavy chain disease, and, finally, acquired hypogammaglobulinemia with nodular lymphoid hyperplasia.

Other less definitive abnormalities in the immunological system have been associated with other gastrointestinal diseases. Of foremost importance is that associated with inflammatory bowel disease. Both Crohn's disease (regional enteritis) and ulcerative colitis may manifest depressed hypersensitivity and diminished cellular immune responses. For instance, negative PPD skin tests as well as positive Kevim test responses have been demonstrated in certain patients with regional enteritis. Humoral antibodies to

E. coli and lymphocytic cytotoxic antibodies to colonic epithelial cells have also been found in these conditions. Another gastrointestinal condition associated with abnormalities in the immune system is pernicious anemia. Seventy-five percent of patients with pernicious anemia present with parietal cell antibodies. However, these antibodies are not specific for pernicious anemia and have also been seen in patients with diabetes mellitus, Addison's disease, iron deficiency anemia, thyroid disease and atrophic gastritis. There is, however, no correlation between the titer of antibodies to parietal cells and vitamin B¹² malabsorption. These antibodies may well reflect gastric inflammatory abnormalities rather than be the cause of the B¹² malabsorption. On the other hand, antibodies to intrinsic factor are specific for pernicious anemia and are found in between 40% to 70% of patients with this disease. Atrophic gastritis and deficient immunoglobulins is associated with diarrhea, giardiasis and increased incidence of carcinoma.

Liver disorders associated with immunological abnormalities have been reported during the past several years involving vasculitis, carcinoma and chronic carrier state. The immune system within the liver is represented by the Kupffer's cells and macrophages.

The most important of these advances has to do with the cause of hepatitis. The initial virus antigen has been found within the nucleus of the hepatocyte and is called the Dane particle. This particle is referred to as the hepatitis core antigen or HBcAg. Once within the nucleus of the hepatocyte, a protein coating material is probably formed around this core and then apparently moves into the cytoplasm of the liver cell. It is then secreted into the circulation where it can be measured. It is called hepatitis B surface antigen or HBsAg. Within this protein surface coating a variety of sub types have been identified and labeled α - common to all, δ , γ , and ϵ . The significance of these substances is that they may have predictive clinical value. For instance, ϵ antigen has been found primarily in hepatitis patients with slow recovery or progression to chronic liver disease.

Clinical use of these viral findings is based upon their measurements which utilize immunological principles and the body's response to these foreign substances. During the first month of exposure to hepatitis B antigen, the surface antigen (HBsAg) can be measured in the serum. The ϵ antigen can also be found in the serum at that time. The core antigen is difficult to measure in serum but can be found in liver biopsy material. Two to three months after the acute attack of hepatitis, anticore antibodies are found as well as evidence of DNA polymerase activity. This is prior to the elevation of

hepatic serum enzymes and clinical jaundice. A small amount of antibody is produced to the surface antigen during the early months of hepatitis and these circulating immune complexes may be responsible for the serum sickness like reactions of urticaria, arthritis and arthralgias, and vasculitis which one can experience with the development of serum hepatitis. The surface antigen is usually cleared within a period of 12 weeks and may be present for a period of up to six months to a year. When found beyond six months the possibility that chronic active hepatitis may be developing should be considered.

From this brief review it is apparent that the immune system may play an important role in gastrointestinal and liver diseases. Unfortunately the manifestations of these various immunological abnormalities are non-specific and may thus go unrecognized for prolonged periods and be mimicked by other conditions. Nevertheless, increasing awareness of immune deficiencies or excesses in GI disease will no doubt further our understanding of their etiology and perhaps enhance our therapeutic armamentarium in the future.



Drug Therapy Problems

ROBERT E. PEARSON, M.S., R.Ph.

Most practitioners rely upon their own reading plus other external sources to assist them in their quest to remain abreast of the biomedical literature. This feature is intended to provide finite information, to answer some questions, and to stimulate awareness of the availability of an unbiased source of biomedical information. The format will include: questions and answers, with the questions being provided by the readers and/or users of our service; abstracts from the literature; brief descriptions of newly-marketed items; brief discussions of new innovations in therapy; and short exercises regarding specific drug products.

Question: A male patient age 55 recently complained to me of increasing breast tenderness and size. His drug regimen for hypertension, hypoparathyroidism, and atherosclerotic vascular heart disease,

includes Spironolactone, Vitamin D, Digoxin, Calcium Gluconate, Nitroglycerin, Isosorbide Dinitrate, and a Potassium supplement. Which of these drugs would cause this symptomatology?

Answer: If the gynecomastia is not a manifestation of non-metastatic carcinoma, then numerous drugs have been shown to induce this finding. Among those drugs the patient is taking at least three (Spironolactone, Vitamin D, and Digoxin) have been shown to cause Gynecomastia. Other drugs that may cause Gynecomastia include: Adrenocortical hormones, androgens, Busulfan, Chlortetracycline, oral contraceptives, Diethylstilbestrol, Digitalis, Digitoxin, estrogens, Ethionamide, Griseofulvin, Haloperidol, human chorionic gonadotropin, Heroin, Isoniazid, Methyldopa, Phenaglycodol, Phenelzine, Reserpine, and Vincristine. (Martin, E.W.; Hazards of Medication, J.B. Lippincott Company, Philadelphia, PA, 1971, p. 365.)

Abstract of Interest: Juhl, R.P., *et al*; Effect of Sulfasalazine on Digoxin Bioavailability, *Clin Pharmacol Ther* 20:387-394, 1976.

To determine whether or not sulfasalazine (Azulfidine) consistently interfered with the therapeutic effect of Digoxin, both drugs were administered to 10 normal subjects (7 male and 3 female) in a crossover study. Subjects were between 20 and 36 years of age with no cardiac, renal, hepatic, or absorptive abnormalities. Subjects received 2 doses of Digoxin (0.5 mg.); one dose given alone, and the second dose after pretreatment with sulfasalazine for 6 days. The pretreatment regimen for 4 subjects was 2 gm. daily in divided doses for 6 days plus 0.5 gm. 30 minutes before Digoxin dose on day 7. The remaining 6 subjects received 2 gm./day, on days 1 and 2, 4 gm./day, on days 3 and 4, 6 gm./day, on days 5 and 6, and 2 gm. 30 minutes before Digoxin dose on day 7. The average area under the serum Digoxin curve (AUC) fell from the control value of 8.79 ng · hr · ml⁻¹ to 6.66 ng · hr · ml⁻¹, while total urinary excretion decreased from 278 mcg/10 days to 228 mcg/10 days. The AUC ranged from +21% to -56%. No mechanism was found to explain the phenomenon.

Abstract of Interest: "Decreased Bioavailability of Digoxin Due to Antacids and Kaolin-Pectin", *NEJM* 295:1034-1037, (Nov. 4) 1976.

Ten normal adult volunteers without evidence of any cardiac, renal, gastrointestinal or other abnormality, were given a single dose of 0.75 mg. of Digoxin, administered in the fasting state. The dose was administered with 60 ml. of 4% Aluminum Hydroxide Gel Suspension, with 60 ml. of 8% Magnesium Hydroxide Gel, with 60 ml. of Magnesium Trisilicate, and with 60 ml. of Kaolin-Pectin. At

least twelve days elapsed between each "Digoxin/antacid" dose. Cumulative six-day urinary Digoxin excretion (expressed as the percentage of a 0.75 mg. dose recovered) was: control, 40.1 ± 3.0 (S.E.); Aluminum Hydroxide 30.7 ± 2.9; Magnesium Hydroxide 27.1 ± 2.4; Magnesium Trisilicate, 29.1 ± 1.7; and Kaolin-Pectin, 23.4 ± 2.0. The decrease was not related to alteration of gut transit time or to adsorption of Digoxin by these gastrointestinal medications.

Abstract of Interest: Andrassy, K., *et al*; Penicillin-Induced Coagulation Disorder, *The Lancet* ii:1039-1041, 1976.

The authors report a case of hemorrhagic diathesis with high serum concentrations of Penicillin G. A 59-year-old female was admitted in acute renal failure. A fluctuating abscess in the submandibular region was palpable. On the suspicion of a mixed anaerobic infection, parenteral Penicillin G, 10 million units/day, was administered. Frank bleeding (Epistaxis) was noted the following day with profuse hemorrhage following incision of the abscess. Bleeding time rose to > 30 minutes and reverted to normal 4 days after withdrawal of Penicillin G. An additional 5 patients who had undergone mitral valvotomy and were given large doses of Penicillin G (30-40 million units/day) are reported to have shown similar coagulation disorders. The authors feel the disorder is a composite result of platelet dysfunction, disturbed conversion of fibrinogen to fibrin, and increased antithrombin-III activity.



Abstracts

Prepared by
George Lastnick, M.D.

Beclomethasone dipropionate aerosol in allergic rhinitis.

D. W. Cockcroft *et al* (St. Joseph's Hospital, Hamilton, Canada) *Can Med Assoc J* 115:523-526 (September 18) 1976.

Treatment with BDA (beclomethasone dipropionate aerosol) 50 ug four times a day in each nostril, was compared with placebo administration (an inert Freon propellant) in a double-blind non-crossover trial of 30 matched patients with allergic rhinitis produced by ragweed pollen. The trial began at the start of ragweed season and lasted for 6 weeks. Patients in the BDH group had significantly less ($P < 0.05$) cough at 10

days, antihistamine tablets consumption at 17 days and nasal stuffiness, rhinorrhea and sneezing at 36 days. No significant difference between the BDA group and placebo group could be demonstrated. The eye symptoms (allergic conjunctivitis), NAIR (nasal airway inspiratory resistance), MINF (maximum inspiratory nasal flow) and TEC (total eosinophil count). Daily diary cards, weekly objective measurement of nasal patency and measurement of TEC before the treatment and after four weeks, were used as criteria to assess the response to treatment. Moderate to great improvement was found in 86% of the BDA group and in the 13% of the placebo group. Minor side effects (headache, post-aerosol sneezing) were noted by two patients in each group. Bleeding by nasal inhalation did not induce adrenal suppression and did not produce local candidiasis in this study. The complications or efficacy of long-term administration of BDA aerosol are not known.

Treatment of diabetic coma with small intravenous insulin boluses.

N. Clumeck *et al*, (University of Brussels, Belgium) *Br Med J* 2:394-396 (August) 1976.

The clinical efficacy of hourly intravenous boluses of 5 u insulin was demonstrated in 21 out of a group of decompensated diabetic patients, presenting in either a ketoacidotic or a non-ketotic diabetic coma. The patients also received the usual fluid and electrolyte replacement. In the 21 patients who responded to this treatment the percentage decrease averaged 50 ± 3% in five hours regardless of the initial glucose concentration. The overall clinical effectiveness is comparable to the other two low-dose regimens, either the hourly intramuscular injections of 5-10 IU insulin, or the continuous intravenous infusions of 1 IU insulin/hour. The efficacy of the low-dose treatments are based on the knowledge that the optimum level of plasma insulin to promote glucose transport is small, lying between 20 and 200 mU/L.

Oral contraceptive in older women and fatal myocardial infarction.

Mann *et al* (University of Oxford, England) *Br Med J* 2:445-447 (August) 1976.

54 women in the 40-44 year age group who died from myocardial infarction, their oral contraceptive histories compared with those of age-matched, living controls. The findings from this study combined with the results from a previous similar one, suggest a three fold increase in the risk of death from myocardial infarction among users of oral contraceptives in the 40-44 year old age group compared with women not using oral contraceptives in the same age group.



Department of
Health Services

BUREAU OF WATER QUALITY CONTROL



ZANNE DANDOY, M.D.

DIRECTOR

The Department's Bureau of Water Quality Control is presently engaged in efforts that will make a significant contribution toward improvement of public health in Arizona through elimination of unsafe and poor quality drinking water.

The Bureau is applying for primary enforcement responsibility in implementation of the Safe Drinking Water Act (P.L. 93-523), a federal program for insuring drinking water protection for everyone by applying stringent standards to individual water suppliers.

That the program is necessary is an understatement. Findings of the National Community Water Supply Study, issued in July 1970, revealed that 2.5 million people were receiving water of inferior quality; some 360,000 of these people were receiving water of potentially dangerous quality.

Our records for Arizona show similar results. For instance, 221 of the state's 1,933 listed public water systems (12 percent) exceed the maximum permissible level of fluoride content in the water delivered. Compliance with the minimum required bacteriological sample submission is less than 25 percent. Further, a small but perhaps significant percentage of the samples analyzed are in violation of the maximum permissible total coliform bacteria concentration.

Compliance with regulations promulgated under the Safe Drinking Water Act—the first revision of drinking water standards since 1962—are expected to reverse those conditions.

Basically, the National Interim Primary Drinking Water Regulations published in 1975 established the bacteriological, chem-

ical radiological and physical standards to be required of all public water systems in the U.S. by June 25, 1979. The intent of the Act is that the burden of compliance with the standards be borne by water suppliers, with individual states assuming primary enforcement authority to assure the standards are met.

Implementation of the Safe Drinking Water Act in Arizona is expected to increase the safety of public drinking water by:

- assuring better inspection, monitoring and sampling;
- developing an increased public awareness through information dissemination, mandatory public notification and public hearings when public water systems fail to meet standards;
- requiring compliance schedules and deadlines for the treatment of poor quality water, and
- providing much greater penalties—heretofore unavailable — for violations.

The new standards will apply to all public drinking water systems that have at least 15 service connections or which regularly service at least 25 individuals daily a minimum of 60 days per year.

I know the Department can count on the support of the medical community in this preventive effort to eliminate an existing source of illness in our state.



Editorial

THE BODY IS IN THE MIND

WILLIAM E. CRISP, M.D.

On a panoramic hilltop overlooking colonial Philadelphia one rainy afternoon about 200 years ago, perhaps during one of the dread yellow fever epidemics, Benjamin Rush, signer of the declaration of independence, framer of the constitution, the father of American psychiatry, one who has walked these very halls

with most of us, is said to have emerged inexplicably from his horse-drawn carriage suddenly overcome with a sense of his healing mission — his therapeutic method; and in this mood, with a burst of zealotry, he is said to have shaken his cane at the city below while uttering the words "bleed and purge all the city".

Benjamin Rush — who undoubtedly saved Washington's revolutionary army with his written hygienic principles, and who had written of his understanding of mind-body relationships, was obsessed with the subject of blood-letting as a medical panacea. He rightly observed that "it raised the pulse when it was depressed, and that it reduced its force — (that it) "Checked vomiting, relieved delirium, coma and obstinate wakefulness, checked hemorrhage and caused redness of the eyes to disappear".

Therapeutic purging and bleeding have passed from this scene but there is a lesson

from this anecdote: it is easy in each generation of physicians to become fervently fascinated with a treatment, or a technological method — a kind of furor therapeutics — which leaves little time or energy for proper analysis, or new concepts.

A bicentennial should not only be a celebration — a birthday, but also a time of reassessment.

Our age in medicine will probably be known as the age of technology, whose achievements include the control of infectious disease, biomedical homostasis that permits advanced surgical techniques, computer epidemiology, to name but a few.

These advances have resulted in an emphasis on analytic techniques and technical solutions of problems of health and disease. These very techniques, however, have produced a practice of medicine — specialty medicine — that has

at: 926 E. McDowell Rd., Phoenix, 85006.
presented at the 225th Anniversary of the founding of Pennsylvania Hospital, Philadelphia, Pennsylvania
part of the Philadelphia bicentennial celebration,
March 30, 1976.

alienated the patient from his disease and his physician.

Numerous studies and our own clinical experience have demonstrated that over 70% of the people who seek our assistance are those with a primary psychosomatic complaint — functional problems with physical overtones.

Most of these patients are treated symptomatically, tranquilized — primarily because of a lack of time or a frustration of experience in dealing with these stress-related illnesses. To date, good psychiatric care remains the providence of the few and "Valium" the expedient for the many.

The challenges for medicine today are the diseases of stress. They are the major killers in our society — heart disease, hypertension, even cancer.

Adaptation, the concept that as organisms become more independent of their surroundings, they develop more complex ways of stabilizing their internal environment to counter changes in the external circumstances, was first recognized and defined by the French physiologist, Claude Bernard, at the time of this country's centennial celebration. The basic theory has been expanded via Cannon's "fight or flight" response to Selye's adaptation syndrome and the role of the adrenal steroids in the neuro-endocrine physiology of the nervous system — stress reaction, or alarm reaction with its triad of lymphothymic involution (T-Lymphocyte inhibition — our major immune system defense mechanism) gastro-intestinal ulceration and loss of cortical lipoid and medullary chromaffin substance from the adrenals.

Physical stress as well as emotional disturbances can trigger the same responses and there are limits to the ability of the human organism to compensate.

Discharge of catecholamines from the adrenal medulla into the circulation is controlled by outflow of impulses from the central nervous system — mediated by a final common pathway arising in the hypothalamus and/or mid-brain.

Catecholamines released from the adrenal medulla and sympathetic nerves during stress mediate the well-known acute metabolic and physiologic responses (hypoglycemia, elevated free fatty acids, tachycardia, blood pressure elevation, and lymphocyte depression).

Although catecholamines released into the blood do not enter the brain, they do penetrate such regions as the area postrema of the hypothalamus where there is a deficiency in the blood-brain barrier. Here they probably play an important role in modifying the rate of release of factors controlling the release of pituitary hormones.

There is some indication that these stress-induced changes in the central nervous system may become more

permanent when repeatedly invoked.

It has been fairly well established that there are certain personality types associated with a major disease state. We are all familiar with the type "A" personality associated with heart disease and hypertension. Psychosocial variables of stress are among the factors that contribute to the disorganization of the homeostatic controls — a cancer-type personality described by Greer in London and Green in Rochester identifies introverted stress as a possible causative factor.

Vernon Riley, of Pacific Northwest Research Foundation in Seattle, recently reported at the association for cancer research that by utilizing C₃H strain of female mice — which carry the transmitted Bittner mammary tumor virus from the time of birth, that he could, by isolating the mice from stress, decrease the expected incidence of mammary cancer from 92% to 7% at 400 days.

Knowing that stress is a major factor in disease, how can it be controlled or modified in our complex society?

To date our medical heritage has relied on only four major curative mechanisms:

1. Physical medicine — aiding and potentiating the body's own defense mechanisms — with heat, cold.
2. Pharmacology
3. Surgery
4. Transference — which is the effect of the person — bedside manner, the placebo effect.

Now with the ability to bring previously involuntary (autonomic) bodily functions under voluntary control via electronic amplification of certain body systems, we have the beginning of a 5th major mechanism — the behavioral control mechanism, in which the patient for the first time can take a fully active and direct control in literally learning not to be sick by controlling stress.

This behavior control mechanism is biofeedback. Biofeedback can be defined as the use of monitoring instruments, usually electronic, to detect and amplify selected internal physiologic processes within the body in order to make this ordinarily unavailable internal information available to the individual by literally feeding it back to him in a recognizable form of a light, a sound, changes or a dial. The clinical importance of this is that by utilizing such organ-specific feedback with continued exposure and practice, (biofeedback training) there is evidence that individuals can learn to bring under partial conscious control particular body functions ordinarily not subject to conscious control such as heart rate, muscle tension, blood pressure, blood flow, even brain waves.

Feedback, therefore, is a method of controlling a system by reinserting into that response the results of past perfor-

mances. Positive reinforcement is gained from the biofeedback machinery and therefore the bodily effects are modified by conscious control.

We should not be surprised at the efficacy of biofeedback since every animal is a self-regulated system, owing its very existence, its stability and most of its behavior, to feedback control. Every change in the physiologic state is accompanied by appropriate change in the mental state.

Each automatic control system can be additionally influenced by higher mental activities. Insertion of the unexpected such as the substitution of the sensory information gained from the biofeedback machine is a sophisticated action of the mid brain and one that begs for experimental clarification of its implication for extending mind ability. The mind-brain cannot operate without information from the body and the body cannot operate without information from the mind-brain. The mind, brain, and body are not merely connected, they exist and function as a unit — a holistic organism.

Even though this fact has been well known, medical science has continued to impose a schizophrenic therapy on the problems of illness. The capacity of the mind to regulate and heal the body and self has been short shrifted almost out of existence. Problems of mind, are nearly always first attacked by salving the mind with drugs.

The fact that learning to control physiologic activity occurs without obvious use of conscious effort and without conscious understanding of how the control works is a dramatic confirmation of the remarkable capability of the mind.

The rapidity and ease of biofeedback learning is difficult to account for in known theory, and literally mandates new insights for study of these internal generated mental abilities that shape what our minds and bodies do.

If people can so quickly learn to control events in their bodies that they scarcely knew existed, are they reactivating a latent ability or are they simply evolving a new capacity of the mind. Either conjecture is provocative. Since we know that this can be readily done in animals even to the point that they can develop organ-specific physiologic changes such as blood supply to the liver, suggests that the control ability has always existed.

A biofeedback principle can be readily illustrated in the well-known association and reproduced ability of the finding that where there is emotional anxiety there is muscle tension, and if muscle tension is relieved, so is the effect of the anxiety. Tension in muscle cells is adjusted by means of a feedback closed loop operation between tension sensors in the muscle cells and the brain areas concerned with

ective muscle movement. The control system operating something like a household thermostat, compares actual tension with what it should be to a given situation and initiates activation of appropriate adjustments. This linear mechanism is ideal for moving muscles and for mobilizing muscles as a first line of defense. The system does not, however, cope well with the way human beings react to social pressures. By social customs physical action is tempered, submerging the defense posture into an unconscious intention to be ready for action, to be alert and tense. When emotional tension and its muscle-tensing effect are prolonged, the system undergoes adaptation and the control becomes adjusted to higher and higher levels of tolerated muscle tension. This is an insidious accommodation that leads to the muscles becoming set in patterns of tension. Its closed loop nature feeds on itself, anxiety tenses the muscles, and the increased tension in muscles keeps the mind apprehensive.

But because of the closed loop, intervention can be either in the mind or in the muscles. Effective psychotherapy can relieve muscle tension, and effective relaxation procedures can also relieve the anxiety. Monitoring of the muscle tension with play-back to the individual constitutes to the individual a method of controlling tension, thereby allaying the effect of the anxiety of his living situation. Modern medicine has not sufficiently emphasized this need for individual possibility in illness. The patient is eliminated to be a recipient rather than a participant in treatment. Therefore he requires personal demonstration through a structured period of self-learning to incorporate the concept of individual possibility into his reaction to an illness even his daily life.

Biofeedback serves as an optimum procedure for this structured self learning in how the patient can regulate the effects of stress on his body functions. Initial instruction in biofeedback is facilitated by use of imagery — awareness, directing the patient's thoughts and feelings through autogenic suggestions. It has been well-demonstrated that patients are able to dilate the vasculature in their hands and can also learn to command individual muscle function, as well as specific brain waves. These abilities can then be transferred to a whole host of stress-related illnesses — some of which include migraine and tension headaches, cardiac arrhythmias, the functional element of hypertension, Reynaud's disease, epilepsy, to name but a few.

The potential of biofeedback to provide new insights into behavioral control of physiologic processes holds the promise of an active participating role for man in learning to deal effectively with his proverbial "worst enemy".



Topics Of Current Medical Interest

H. N., M.D.

RICHARD E. H. DUISBERG, M.D.

H. N., M.D., is a well-liked and competent physician who has practiced in a metropolitan area of Arizona for about 12 years. He married during his residency, has two children, one in 7th, the other in 9th grade. A happy, congenial home.

He enjoys tennis, a bit of hunting in season and good company. He is well respected and well liked by his colleagues and by his patients.

Indeed, his practice has grown quite large and gives him rather little time to relax. A few years ago, when very tired, he occasionally took a dextedrine—when unable to sleep, a placidyl or some other sample soporific.

During the past two years he has seemed less sociable, less humorous. At times he is morose, at times short-tempered, at times preoccupied, seemingly aloof.

Only he knows that he has tried time and again to function without taking a pill or capsule—but has not succeeded for longer than a few days.

Once he was a social drinker and convivial. Lately he either slumps into lethargy or becomes noticeably loquacious and slurring after two drinks.

They are beginning to avoid him. His wife has become a worrier. She can't "control" the kids. Quarrels are becoming frequent.

His friends (colleagues mostly) also wonder about him. They occasionally raise an eyebrow or even ask a tentative question. They drop away. He drops them.

His practice slows. It's "the recession" or a "seasonal slump".

His wife finally discovers the extent of his dependency on drugs.

More months of worry, arguments, pleadings, promises. Finally he agrees to let her invite an old and trusted colleague for a "talk". Good advice is heard and accepted. But not followed.

From here on the prognosis is, despite all wishful thinking, grim. Something must be done before disaster strikes, as inevitably it will. But what to do? He's a DOCTOR! He has a family to support. A practice to retain. A reputation to uphold. His pride to preserve.

Can a wife jeopardize all this plus her own survival by "betrayal"?

Can his friend?
Can he?

And even IF he consents to see a physician or psychiatrist, will the "cure" take? Will the skeleton emerge from the closet? Will disgrace occur?

A difficult and hazardous choice. Action now might be calamitous, and a breach of confidence. Procrastination is easier—though the added spice of hope is growing rancid. The prognosis won't improve. It will worsen.

Hard decisions can be resolved by compromise. Though, for some, the word "compromise" carries an unpleasant stigma of weakness or cowardice—the act of compromise is a mature and usually laudable one.

A compromise, a third option, now exists. Consider appealing ("reporting" if you like) to ArMA's Physicians' Rehabilitation Committee. The troubled physician can be helped. He will not be hurt. The prognosis will change from grave to good. It already has for quite a few.

A friend, a spouse or indeed anyone who is aware of and concerned over a physician who appears to be in trouble or heading for some needs only to contact a member of the committee and discuss the problem with him or her.

Confidentiality will be preserved, including the name of the referring individual if desired.

The physicians' rehabilitation committee will thereafter, in accordance with the exigencies of the problem, take over full responsibility for meeting all of the ethical, legal, and, if indicated, counseling and therapeutic steps required.

The patient physician's best interests remain the prime concern of the committee. Confidentiality is given utmost consideration, by the committee as well as by the Board of Medical Examiners to whom (by law) the physician's name, along with the committee's recommendations, is submitted. The Board does NOT intervene unless legal aspects of the case demand it. Thus, a timely appeal to the committee provides an interventive helping hand which, in most cases, renders involvement of the patient with BOMEX unnecessary.

Be a real friend, wherever you see a friend in need of one.

Use ArMA's helping hand. You may write or phone the following committee members:

BENDHEIM, OTTO	5051 N. 34 St., Phx.
BISHOP, WILLIAM	703 Ash Street, Globe
CLYMER, JOHN	703 N. Country Club Rd., Tucson
CRISP, WILLIAM	926 E. McDowell Rd., Phx.
CZERNY, EVERETT	1601 N. Tucson Blvd., Tucson
DAMSTRA, DONALD	St. Lukes Hosp. Med. Center, Phx
DUISBERG, RICHARD	1313 N. 2nd St., Phx.
GREEN, WESLEY	2501 N. 4th St., Flagstaff
KAHLE, JOHN	715 N. Beaver St., Flagstaff
LINKNER, LAURENCE	3411 N. 5th Ave., Phx.
SATTENSPIEL, EDWARD	333 W. Thomas Rd., Phx.
SCHIEBER, STEPHEN	Ariz. Med. Center, U of A
TOMLINSON, WALTER	P. O. Box 4, Elgin, Az.
VOLDENG, KARI	St. Lukes Hosp. Med. Center, Phx.
WASKOW, ELEANOR	550 W. Thomas Rd., Phx.
BUTLER, HARRISON	Maricopa County Hospital, Phx. (House Staff Chairman)

955-6200
425-5759
793-8865
258-8995
327-5628
253-7373
254-5161
774-4347
774-7345
279-7397
264-3267
882-6315
455-5572
258-7373
266-8236
267-5011

You may also write or phone Bruce Robinson, Executive Director, ArMA, at 810 W. Bethany Home Rd., Phoenix, Phone 246-8901.

THE UNREQUESTED MULTIPHASIC TEST

RALPH L. GORRELL, M.D.

Certain promoters are "selling" multiphasic testing direct to laymen. While working for the Air Force, I received letters and phone calls about my approval of a Phoenix based laboratory which was performing multiphasic blood screening and urine examination.

Since these are "screening" procedures, they are not relevant to the usual care of medical and surgical patients, they do not fit in the usual charts and especially not in the problem oriented record. The physician has the sort of uneasy feeling that he should include the data but is not sure that the results are accurate.

Medical World News (Nov. 15, 1976) has a further reason for doctors in private practice to refuse such reports. What has happened: A large California employee group has a group health contract that entitles its members to routine screening. The tests are taken without the doctor's knowledge and the results forwarded to him, even though he may not recognize the patient.

Lawyers for the California Medical Association state that the mere receipt of the report does not establish a physician-patient relationship. However, if the patient has been under the care of the doctor at any time, the physician is in an untenable position and especially so if the tests reveal a condition that needs

treatment . . . The physician has the duty to get in touch with the former patient . . . This may not be possible. The lawyers suggest that the physician return the report to the laboratory with a letter stating that the person is not a patient at present, stating that no arrangement has been made for review of the report and that there is no authorization to proceed. The suggestion is that the patient be contacted directly. Then the potential patient can notify the physician's office if he wishes the doctor to have a copy of the report and to relate it to his medical care.

AUXILIARY HIGHLIGHTS

JEAN (MRS. M. W.) PHILLIPS
Auxiliary Editor

When an Auxiliary has a particularly effective project, it goes in the bank! Into the Project Bank at National, that is. In this way, good effort is shared with other Auxiliaries across the nation.

The Bank now contains ideas and resources covering a wide spectrum of subjects with unique, innovative approaches. Arizona's many inspiring contributions include child, home, and water safety programs now being repeated in other areas.

Projects often grow beyond their original scope as they are applied to specific needs in individual communities, and practicality prevails when solutions are used to meet real problems known to exist. For this purpose, the Auxiliary Project Bank is filled with assets.



Letters to Editor

Dear Sir:

This letter is to protest the use of "Topics of Current Medical Interest" for what should be paid political advertisements. The furor of Proposition 200 is now history, but without going into the wide gray zone between the statements of the two sides, there was a great difference of scientific opinion as to this proposition. Dr. Bruwer's article summarizes quite well a position near one pole. His "References" were mostly news releases, and this article simply is not a scientific article but a political diatribe.



ArMA Reports

THE MINUTES APPEARING IN THIS SECTION HAVE BEEN EDITED TO CONSERVE SPACE. A COMPLETE COPY OF THE MINUTES OF ANY MEETING WILL BE MAILED TO ANY MEMBER REQUESTING THEM.

MATERNAL & CHILD HEALTH CARE COMMITTEE

The meeting of the Maternal & Child Health Care Committee of the Arizona Medical Association, Inc. held September 25, 1976 at 8 West Bethany Home Road, Phoenix, Arizona convened at 1:25 p.m., William C. Scott, M.D., Chairman presiding.

SECTION ON SERVICES FOR CHILDREN Designation of Chairman

Dr. Scott announced his reappointment of Glen M. Friedman, M.D., as Chairman of the section for the coming year.

EPSDT

Dr. Scott reviewed the question referred to the section regarding whether or not the child EPSDT program was required to be screened by this program prior to being seen by a private physician.

The section's response to the above question was set forth in the following statement:

THAT ALTHOUGH EPSDT IS A PART OF THE MEDICAID PROGRAM, IT DOES NOT IN ANY WAY REPLACE OTHER TREATMENT NECESSARY FOR THE CHILD. THEREFORE IT IS NOT NECESSARY FOR A CHILD TO BE SCREENED BY EPSDT PRIOR TO BEING SEEN BY A PRIVATE PHYSICIAN.

Medicaid

Dr. Scott reported on the section's desire to have the Association reaffirm its position

It is perfectly proper for opinions to be published as editorials. A sense of fairness requires that a forum be provided for reply to the statements made. To publish it in a month before an election indicates the excellent timing of the author and attention to the doctrine of fairness by the editorial staff. I would point out that it would have been equally reprehensible to have carried a statement *against* this position by the Arizona Atomic Energy Commission, which appeared to be ingringing in improprieties as employees of state government. It is to be hoped that in the future, on political matters we will provide equal time or no time.

Sincerely,
V. Hilts, M.D., F.A.C.P.

Dear Sir:

In response to the outrage expressed by my good friend, Doctor Schuyler V. Hilts, the publication by *Arizona Medicine*, in the October issue, of an article by me on the matter of "Informed Consent: Radioactive Waste Products and the Arizona Nuclear Safeguards Initiative (Proposition 200)", I quote from the first three paragraphs of my letter which accompanied the manuscript:

"I herewith submit an opinion statement on the matter of radioactive wastes arising from the nuclear fuel cycle.

"The statement touches on the major potential health hazard posed by these wastes and . . . the opportunity for public discussion presented by the November Initiative (Proposition 200).

"Needless to say, I understand that this may be regarded as 'controversial', but it is so hard to find anything that is not controversial these days—even the matter of fishing lures".

It is my conviction that Doctor Kennedy acted responsibly and in good faith when he approved publication of my admittedly controversial article. The article was not a political diatribe but a statement in regard to the current status of nuclear waste management, a matter which has overwhelming health implications. The fact that nuclear waste management is also a matter having vast political implications is exemplified by Dr. Hilts' litmus paper reaction to the article.

The references I used were entirely in keeping with a scientific article and were

reputable: a renowned health physicist; a Nobel Laureate in Physics; and three top-level members of the Nuclear Regulatory Commission. Quotations from the latter three were from the texts of speeches they had delivered to members of a highly technical industry and published in full in an informative publication of the United States Nuclear Regulatory Commission.

The "furor over Proposition 200" may now be history. But the debate concerning the potential health hazards of high-level radioactive waste products of nuclear power plants is probably still in its infancy. I would hope that the Editor of *Arizona Medicine* would invite Doctor Hilts and others to participate. After all, the Environmental Protection Agency has stated: "The number of expected health effects is the bottom line in any assessment of reactor safety. Such risk estimates are highly uncertain on the basis of present knowledge and the adequacy with which these uncertainties are addressed is central to providing an informative estimate of reactor safety".

Sincerely,
Andre Bruwer, M.D., F.A.C.R.

of the Medicaid program. Following extensive discussion the following action was taken:

IT WAS MOVED AND CARRIED TO RECOMMEND TO THE BOARD OF DIRECTORS THAT THE ARIZONA MEDICAL ASSOCIATION PUBLICLY REAFFIRM ITS POSITION IN FAVOR OF THE IMPLEMENTATION OF A MEDICAID PROGRAM IN ARIZONA AS SOON AS FEASIBLE.

Poppled Children's Hospital

Dr. Colton reported on the current reorganization underway in the DHHS wherein the Poppled Children's Hospital will be a part of the Division of Family Health which will also include Maternal & Child Health, Child Development, Nutrition, Dentistry etc. Other divisions will include Laboratory Services, Behavior Health, Environmental Health and Sport divisions.

Dr. Colton reviewed the background of the Medicaid staff bylaws changes and the current status of the medical staff organization which provides for much greater access to the staff.

SECTION ON MATERNAL SERVICES

Designation of Chairman

Dr. Scott announced his reappointment of Dr. B. Cherny, M.D. as Chairman of the section.

Maternity Insurance Services

Dr. Cherny reviewed HB 2326 which would require insurance companies to provide maternity coverage under all health insurance programs. The bill died in the House of Representatives during the 1976 legislative session.

IT WAS MOVED AND CARRIED TO RECOMMEND TO THE LEGISLATIVE COMMITTEE THAT A MATERNITY COVERAGE BILL, SIMILAR TO THE ROG MODEL BILL, BE REINTRODUCED TO THE 1977 LEGISLATURE.

SECTION ON PERINATAL SERVICES

Designation of Chairman

Dr. Scott announced his reappointment of William J. R. Daily, M.D. as Chairman of the section for the coming year.

Arizona Perinatal Program

Sharon L. Barger, M.P.H., Assistant Director of the Arizona Perinatal Program reviewed in great depth the first year's operation of the program. The 33 page report is too long to reproduce as part of these minutes, but they are available from the Association offices. It was suggested that the report be reprinted in a future issue of *Arizona Medicine*.

Project Apache

Ms. Barger reported on the new Project Apache grant and how it fits with the Arizona Perinatal Program. This is an ongoing program with the Whiteriver Apache Tribe formally administered by the Good Samaritan Services that parallels very closely the goals and objectives of the A.P.P.

Meeting adjourned 2:55 p.m.

William E. Crisp, M.D.

Secretary

by

Bruce E. Robinson

Executive Director

REVIEW

Dr. Duisberg reviewed the history of the committee from its inception. He pointed out that even with extensive material in *Arizona Medicine*, *Medical Memos*, *Roundup* and *Sombrero*, there seemed to be very few referrals, seven so far. Concern has been expressed over the need to report to BOMEX which may be one of the reasons for the few referrals.

It was suggested that additional articles be prepared that would be of the disguised "Case History" type, with emphasis placed on the value of getting the sick physician in for help early.

Each committee member is to discuss the existence and role of the committee with as many of his colleagues as possible as well as bringing the committee to the attention of the various hospital staff meetings.

Meeting adjourned 12:14 p.m.

William E. Crisp, M.D.

Secretary

by

Bruce E. Robinson

Executive Director

PUBLIC RELATIONS COMMITTEE

The meeting of the Public Relations Committee of the Arizona Medical Association, Inc. held at 810 West Bethany Home Road, Phoenix, Arizona on Tuesday, October 19, 1976 convened at 5:58 p.m., Charles H. Finney, M.D., Chairman presiding.

REVIEW

Dr. Finney reviewed the past and present programs of the Committee and discussed how they can best be improved. There was a general discussion on the subject of responding to adverse news stories. Mr. Julian DeVries

PHYSICIAN REHABILITATION COMMITTEE

The meeting of the Physician Rehabilitation Committee of Arizona Medical Association, Inc. held at 810 West Bethany Home Road, Phoenix, Arizona on Sunday, October 3, 1976 convened at 10:13 a.m., Richard E. H. Duisberg, M.D., Chairman presiding.

provided information regarding to whom letters and articles should be directed. He pointed out that letters to the Editor are often a good way to start, and often can be developed into a subsequent news story.

"MEDICAL OPINION" TV SERIES

Mr. Peterson reviewed the suggested changes in the TV series as follows:

Format: Identical to that previously presented, with 3 exceptions. 1) The program would be taped recorded, rather than broadcast live; 2) each program would begin with a 3 to 5 minute filmed interview (in a hospital, research lab, physician's office or similar setting) which would serve to underscore the significance of the topic to be discussed; and 3) since the program would be taped, the station would establish a permanent telephone line for the purpose of recording viewers' questions throughout the five days preceeding each program.

This later action would eliminate the need for the Association to provide a third physician participant—the 'screener'—for each program.

Frequency and Timing: Weekly, rather than monthly. The programs would be taped on Friday evenings from 6:45 to 7:15 p.m. Programs would be broadcast from 5 to 5:30 p.m. each Saturday.

Subject to the Association's endorsement, the series would begin either October 16 or 23.

Moderator: Dr. DuVal has indicated a willingness to serve as the moderator for approximately half of the programs. KOOL staff member Dennis Johnson, who has handled virtually all of the station's medical-related news coverage for several years, would serve as the moderator on alternate weeks.

ArMA's Role: Within the above proposed structure, the Association would still be responsible for selecting the topics, providing the station with background information on each and for 'recruiting' the two physician panelists for each program.

Credits to the Association (introductory and closing scripts, printed reference in rolling credits at the end of the program, and incorporation of the ArMA seal in the studio set) would remain unchanged.

Audience: Media rating service figures indicate approximately 140,000 households have television on during 5 to 5:30 p.m. programming each Saturday. This compares with approximately 176,000 households during 6:30 to 7:00 p.m. programming. The total number of potential viewers for the rescheduled "Medical Opinion" series, therefore, would be reduced by about 20%.

During most rating periods in the past 32 months, "Medical Opinion" has been the most watched program during its time slot. It also had more viewers than any of the other three programs KOOL aired on a tandom basis during the 6:30 to 7:00 p.m. time slot.

The Committee's job is to develop a list of possible panelists and topics.

The chairman directed that a letter be directed to each committee member asking them to submit a list of ten names of physicians who would be good at participating in this type of activity.

Meeting adjourned 7:29 p.m.

William E. Crisp, M.D.
Secretary
by
Bruce E. Robinson
Executive Director

PUBLISHING COMMITTEE

The meeting of the Publishing Committee of the Arizona Medical Association, Inc. held at 810 West Bethany Home Road, Phoenix, Arizona on Saturday, October 23, 1976 convened at 1:07 p.m., John W. Kennedy, M.D., Chairman and Editor presiding.

ECONOMICS OF ARIZONA MEDICINE

Mr. Robinson reviewed the financial statements for the year 1975 and the first nine months of 1976 which show the continued decline in national advertising and increase in printing expense. He also reviewed in depth the printing bills for the past five months showing just how the cost of publishing *Arizona Medicine* is determined.

Discussion ensued on items that might help to reduce the cost including:

- Using the cover page as the index page with no extra color.
- Reduction of white space.
- Print "minutes" and "meetings" sections on cheaper paper.
- Abstracting the minutes of meetings.

IT WAS MOVED AND CARRIED TO EXPLORE THE COST OF PRINTING THE "ArMA REPORTS" SECTION AND THE "FUTURE MEETINGS" SECTION ON CHEAPER PAPER IN AN ABSTRACTED FORM.

Mr. Robinson reported that he would put the journal out for comparison pricing as soon as a final format was determined.

REVIEW OF EDITORIAL POLICIES

Dr. Kennedy reviewed for the committee the recent membership opinion survey and the comments made regarding *Arizona Medicine*, both positive and negative.

Review Articles

Discussion ensued on the need for short, concise, review articles encompassing a wide range of material useful to the primary physician in treating or directing his patient for proper special treatment.

Format

Comment was made on the need for more editing of the "ArMA Reports" section on the journal while at the same time getting additional reports published about activities of the Association from committee chairmen and staff.

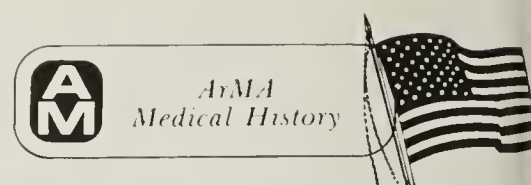
Editorial

It was highly recommended that the Editor reinstate an "Editorial Board" whose function would be to assist in directing editorial policy and securing scientific material. George D. Comerci, M.D. of the College of Medicine agreed to explore means of obtaining extensive editorial cooperation from the teaching staff.

The whole process by which the editor is selected was discussed at some length.

Meeting adjourned 2:43 p.m.

William E. Crisp, M.D.
Secretary
by
Bruce E. Robinson
Executive Director



COCHISE COUNTY HOSPITAL

Cochise County Hospital was built in Tombstone in the 1880's but moved to the outskirts of Douglas in about 1909 or 1910.

At the turn of the century the hospital was in a deteriorated state. In 1909 the County Board of Supervisors allocated funds for the construction of another county hospital to be located west of Douglas.

When it was completed Dr. Edward Adamson was appointed medical superintendent for the hospital. Dr. Adamson arrived in Douglas in 1905 to assist Dr. I. T. Wright with the old Calumet Hospital.

Dr. Adamson, writing in the Dispatch on Dec. 30, 1939 said, "When the day came to remove the patients from Tombstone orders were given to have a meal on the table when they arrived. At the sight of clean tables and a bountiful supply of food, a near riot broke and it required the combined effort of Howard Hall, the resident superintendent and myself to quiet them and assure them that there was plenty of food for all."

"They had been having their meal brought to the hospital in five gallon gasoline cans which were dropped in the middle of the room and it was 'first come, fullest served.'"

Dr. Adamson's first duties included hiring all the employees and traveling to New York and Chicago to purchase equipment for the building.

Because it was well developed the hospital became what is termed a "political plumb." With the next election Dr. Adamson was removed from his position. In the next 12 years 16 doctors and eight superintendents held positions in the hospital.

In 1924, Dr. Adamson resumed his position with the understanding he would stay as long as service was satisfactory. He stayed for the next 37 years.

Dr. Adamson wrote, "When I took over again, the institution was in a deplorable condition. The physical plant was going to pieces, all of the buildings needed extensive repair, equipment was behind times, and little up-to-date medicine was being practiced and practically no surgery was being performed."

He began to improve conditions at the hospital by investing in a new refrigeration plant that immediately saved the county \$300 a month. The building's coal burner heating apparatus was replaced

a boiler and oil fuel system. At the same time, work began on a nurses complex. Nurses previously lived in the building with the patients.

Former Chief Nurse at the hospital Mrs. George Kazal, speaking in 1971 of those years at the hospital said the main building contained a lobby, hospital proper, four wards and an operating room.

"Operating room," she said, "seemed like the hottest place on earth. There were no skylights in the ceiling that allowed light to pour into the room. We sterilized our instruments by steam from gas burners. And it always seemed that surgery was scheduled for one o'clock in the afternoon, which added to the intense heat."

Outside the main building there were convalescence halls for convalescing indigents and a special area for the tuberculosis patients to avoid spreading the contagious disease.

At the time there were 42 beds in the hospital. If there was an overload beds were stacked in the lobby.

Between 1930 and 1955 the tuberculosis wards were replaced by a building. About the same time state law prompted a \$5,000 improvement program.

Under this program a new x-ray room was added, the kitchen was completely renovated, the operating section remodelled and a nursery was created. A standby electric generating plant was built.

In 1957, the County Board of Supervisors appropriated \$250,000 for the construction of an obstetrical department, children's ward, semi-private rooms and covered porches.

Three years later in 1960 Dr. Adamson resigned his position after four decades as superintendent. Dr. Robert Montgomery replaced Dr. Adamson as medical director and manager of the hospital. He continued in those positions for six years.

As the hospital approached the late 1960s, it became evident that its burgeoning size and complexity was becoming more complicated. On June 28, 1967 the Cochise County Hospital Association, a nonprofit Arizona corporation was formed to provide the administrative leadership needed to bring the hospital up to date.

With Dr. Montgomery elected as president the first Board of Directors consisted of George Swanson, Robert Hargis, Theodore H. Troller, Jack R. Netcher, James F. McNulty, Jr., Thomas Clews, Frank Hamilton and Dr. Kenneth A. Gseth. Dr. George A. Spikes was elected vice-president and Dale F. Mock secretary-treasurer and administrator.

In late 1967 the association explored general funding and obtained funds to add a 32 bed addition to the hospital. Shortly afterwards, Gerald R. Conley was hired as administrator. He continued at that capacity until the present admin-

istrator, Herman J. Spencer, replaced him in 1973.

During 1973 Phelps Dodge Corp. approved plans to close its Douglas Hospital, Ninth St. and F Ave. In November, 1974 a new obstetrical wing, paid for by Phelps Dodge, opened at the hospital. During that month the Douglas Hospital closed its doors.

On Dec. 1974 a building loan agreement was entered into by the county hospital. The agreement provides for a building loan of \$1,983,800 from the University of Texas to the Hospital Association with the funds applied towards future construction.

Agreement was made with HEW, University of Texas and County Hospital Association. The loan will be paid back over the period of 25 years with the federal government paying \$952,000 in interest during the term of the loan.

Significant benefits of the loan agreement were emphasized in an editorial. The Daily Dispatch on Dec. 27, 1974: "The new building program will bring the hospital into complete compliance with state health requirements. Since the cost will be borne by the patients who use the hospital, there will be no added taxpayer expense. Furthermore, next fall (Fall, 1975) Medicare will unburden the county of providing indigent care which means the county will be more or less out of the health care field except for nursing and boarding home aid.

"Another significant factor is that had the county been forced to achieve the new building program, the usual course would have been to float a bond issue. The association attained the same goal without such financial recourse. Still ahead will be the possible formation of a hospital district . . .

"... the pumping of nearly \$2 million into the local economy at a time when the building industry and those who work in it are at a low ebb, the new hospital building program provided a bright spot in the 1975 economic outlook."

Construction on the new buildings began almost immediately and is expected to be completed in the summer of 1976.

In August, 1975 The Board of Commissioners of the Joint Commission on Accreditation of Hospitals said Cochise County Hospital and nursing home were granted accreditation status for a period of two years.

An in-depth survey for accreditation was conducted by the Joint Commission in April, 1975. The hospital was accredited for the first time in 1971, Herman J. Spencer, administrator for the hospital said.

ARIZONA MEDICINE

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Phoenix, Arizona 85013

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CONTRIBUTIONS

The Editor sincerely solicits contributions of scientific articles for publication ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Material submitted for publication in ARIZONA MEDICINE should conform to the following policies:

1 Manuscripts, including references or bibliography, should be typewritten, double-spaced, on one side of the paper only, and the original and a carbon enclosed

2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

3. Although the Editors try to catch inaccuracies, the ultimate responsibility is the author's.

4 Articles are accepted for publication only if they are contributed exclusively to this Journal. Ordinarily, contributors will be notified within 60 days if a manuscript is accepted for publication. Every effort will be made to return unused manuscripts.

5. The Journal reserves the right to edit all material.

6. Reprints will be supplied to the author at printing cost

7. Effective January 1977 Bibliographies will not be published, but available upon request.





Future Medical Meetings

CONTINUING MEDICAL EDUCATION

THE FOLLOWING INSTITUTIONS HAVE RECEIVED ArMA ACCREDITATION FOR CONTINUING MEDICAL EDUCATION.

ARIZONA STATE HOSPITAL, PHOENIX
DESERT SAMARITAN HOSPITAL, MESA
GOOD SAMARITAN HOSPITAL, PHOENIX
PHOENIX INDIAN MEDICAL CENTER
MARICOPA COUNTY GENERAL HOSPITAL, PHOENIX
MEMORIAL HOSPITAL, PHOENIX
ST. LUKE'S HOSPITAL AND MEDICAL CENTER, PHOENIX
ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER, PHOENIX
TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM, TUCSON
VETERANS ADMINISTRATION CENTER, PRESCOTT

CONTINUING MEDICAL EDUCATION ACTIVITIES SPONSORED BY THESE INSTITUTIONS RECEIVE CATEGORY 1 CREDIT FOR THE ArMA CERTIFICATE IN CONTINUING MEDICAL EDUCATION AND THE AMA PHYSICIAN'S RECOGNITION AWARD.

FEBRUARY

TENTH ANNUAL SOUTHWESTERN CLINICAL PHARMACY SEMINAR

FEB. 25-27, 1977, Marriott Hotel, Tucson, AZ. Sponsor: College of Pharmacy, U of A Tucson. Contact: Carl E. Trinca, M.S., College of Pharmacy Rm 102, U of A, Tucson 85721. Approved for 8 required hours toward the ArMA Certificate in Continuing Medical Education.

SYMPOSIUM ON HEADACHE

Feb. 2, 1977, Sheraton Greenway Inn, Phoenix. Sponsor: Headache Group of the Southwest. Contact: G. Scott Tyler, M.D., 2610 W. Bethany Home Rd., Phoenix, AZ 85017. Approved for 3 required hours toward the ArMA Certificate in Continuing Medical Education.

BREAST CANCER UPDATE 1977

Feb. 5, 1977, Good Samaritan Hospital, 1033 E. McDowell Rd., Phoenix. Sponsor: Division of Oncology, Good Samaritan Hospital. Contact: Ms. Susan Lyman, Good Samaritan Hospital, Division of Oncology, 1033 E. McDowell Road, Phoenix AZ 85006. Approved for seven required hours toward the ArMA Certificate in Continuing Medical Education.

NEW CONCEPTS IN INFECTIOUS DISEASE

Feb. 17-19. Sponsor: American College of Physicians & U of A College of Medicine. Contact: Registrar, Postgraduate Courses ACP, 4200 Pine St., Philadelphia, PA 19104. Approved for 15 3/4 hours toward the ArMA Certificate in Continuing Medical Education.

MARCH

INTERNATIONAL CONFERENCE ON THE ADJUVANT THERAPY OF CANCER

March 2-5, 1977, Doubletree Inn, Tucson, AZ. Sponsor: U of A College of Medicine. Contact: Stephen Jones, M.D. or Sydney Salmon, M.D., U of A College of Medicine. Approved for 22 required hours toward the ArMA Certificate in Continuing Medical Education.

CONTEMPORARY MANAGEMENT OF ACUTE MYCARDIAL INFARCTION BY THE FAMILY PHYSICIAN

March 17-19, 1977, Adams Hotel, Phoenix, AZ. Sponsor: American College of Cardiology & American Academy of Family Physicians. Contact: Mary Anne McInerney, American College of Cardiology, 9650 Rockville Pike, Bethesda, MD 20014.

CLINICAL RECOGNITION AND MANAGEMENT OF HEART DISEASE

March 17-19, Arizona Health Sciences Center, Tucson, AZ. Sponsor: U of A College of Medicine. Contact: Frank I. Marcus, M.D., Arizona Health Sciences Center, Tucson, AZ 85724. Approved for 20 required hours toward the ArMA Certificate in Continuing Medical Education.

EMERGENCY MEDICINE: CLINICAL-RADIOLOGICAL CORRELATION

March 18-20, 1977, Pointe West Resort, Phoenix AZ. Sponsor: Maricopa County General Hospital, Contact: Austin R. Sandrock, M.D., Chairman, Dept. of Radiology, Maricopa County General Hospital, 2601 E. Roosevelt, Phoenix, AZ 85008.

ARIZONA SOCIETY OF OTOLARYNGOLOGY & MAXILLO-FACIAL SURGERY

March 4-5, 1977, Camelback Inn, Scottsdale, AZ. Sponsor: Arizona Society Otolaryngology & Maxillo-Facial Surge. Contact: Floyd K. Berk, M.D., P.O. Box 27466, Tucson, AZ 85726. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DAY OF NEPHROLOGY

March 11, 1977, Camelback Inn, Scottsdale, AZ. Sponsor: St. Joseph's Hospital Medical Center, Dept. of IM. Contact: Ethelann Murray, M.D., St. Joseph's Hospital and Medical Center, 350 W. Thomas Rd., Phoenix, AZ 85013. Approved for 1 required hours toward the ArMA Certificate in Continuing Medical Education.

DAY OF NEPHROLOGY

March 11, 1977, Camelback Inn, Scottsdale, AZ. Sponsor: St. Joseph's Hospital Medical Center, Dept. of IM. Contact: Ethelann Murray, M.D., St. Joseph's Hospital and Medical Center, 350 W. Thomas Rd., Phoenix, AZ 85013. Approved for 1 required hours toward the ArMA Certificate in Continuing Medical Education.

SELECTED TOPICS IN LIVER DISEASE OF CLINICIANS

March 18-19, 1977, Scottsdale Hilton I Resort, Scottsdale, AZ. Sponsor: Maricopa County General Hospital Dept. of Medicine, Contact: Harry F. Lenhardt, M.D., Maricopa County General Hospital, 2601 E. Roosevelt, Phoenix, AZ 85008. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

UPDATE: PRIMARY CARE 1977

March 23-26, 1977, Arizona Health Sciences Center, 15011 N. Campbell, Tucson, AZ. Sponsor: U of A College of Medicine Office of CME. Contact: George D. Comerci, M.D., U of A College of Medicine, Tucson, AZ 85724. Approved for 22 required hours toward the ArMA Certificate in Continuing Medical Education.

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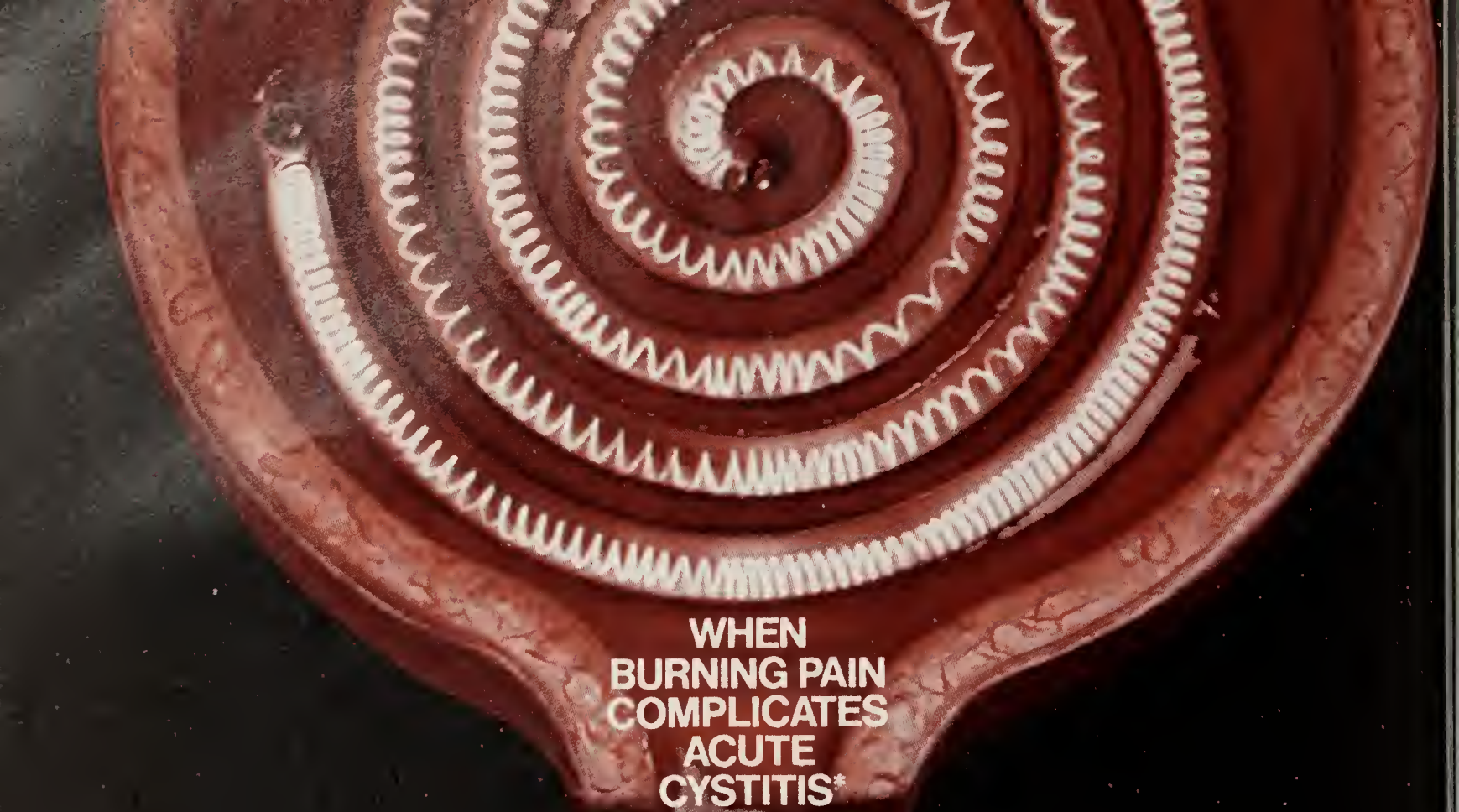
Hearing losses are among the most consistently neglected health problems. Many people with them won't even admit it to themselves, let alone others. A little encouragement may start them thinking about themselves more realistically.

That's why we're offering you the poster shown here. You can hang it on the wall or stand it on a small table. It comes with booklets called "As precious as sight" that give your patients some basic facts about auditory testing and hearing losses and how easy they are to correct in many cases.

Write to us for your free poster and booklets. They just might help you to help some patients who aren't hearing as well as they used to. Even those who ordinarily wouldn't hear of it.

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WHEN A HEARING
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WHEN
BURNING PAIN
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TURN IT OFF WITH
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Each tablet contains 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl.

FOR THE PAIN

- Quickly relieves painful symptoms such as burning and pain associated with urgency and frequency.
- Recommended antibacterial therapy: up to 3 days with Azo Gantanol, then 11 days with Gantanol (sulfamethoxazole).

Before prescribing, please consult complete product information, a summary of which follows:

Indications: In adults, urinary tract infections complicated by pain (primarily pyelonephritis, pyelitis and cystitis) due to susceptible organisms (usually *E. coli*, *Klebsiella-Aerobacter*, *Staphylococcus aureus*, *Proteus mirabilis*, and, less frequently, *Proteus vulgaris*) in the absence of obstructive uropathy or foreign bodies.

Note: Carefully coordinate *in vitro* sulfonamide sensitivity tests with bacteriologic and clinical response; add aminobenzoic acid to follow-up culture media. The increasing frequency of resistant organisms limits the usefulness of antibacterials including sulfonamides. Measure sulfonamide blood levels as variations may occur; 20 mg/100 ml should be maximum total level.

Contraindications: Children below age 12; sulfonamide hypersensitivity; pregnancy at term and during nursing period; because Azo Gantanol contains phenazopyridine hydrochloride it is contraindicated in glomerulonephritis, severe hepatitis, uremia, and pyelonephritis of pregnancy with G.I. disturbances.

Warnings: Safety during pregnancy not established. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been reported and early clinical signs (sore throat, fever, pallor, purpura or jaundice) may indicate serious blood disorders. Frequent CBC and urinalysis with microscopic examination are recommended during sulfonamide therapy.

Precautions: Use cautiously in patients with impaired renal or hepatic function, severe allergy, bronchial asthma; in glucose-6-phosphate dehydrogenase-deficient individuals in whom dose-related hemolysis may occur. Maintain adequate fluid intake to prevent crystalluria and stone formation.

Adverse Reactions: Blood dyscrasias (agranulocytosis, aplastic anemia, thrombocytopenia, leukopenia, hemolytic anemia, purpura,

FOR THE PATHOGENS

- Effectively controls susceptible pathogens such as *E. coli*, *Klebsiella-Aerobacter*, *Staph. aureus*, *Proteus mirabilis* and, less frequently, *Proteus vulgaris*.

*nonobstructed; due to susceptible organisms

hypoprothrombinemia and methemoglobinemia); allergic reactions (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); G.I. reactions (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); CNS reactions (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); miscellaneous reactions (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. Usual adult dosage: 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

NOTE: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

Supplied: Tablets, red, film-coated, each containing 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl—bottles of 100 and 500.

ROCHE

Roche Laboratories
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110

DYAZIDE[®]

Trademark

Each capsule contains 50 mg. of Dyrenium[®] (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

MAKES SENSE FOR LONG-TERM CONTROL OF HYPERTENSION*



Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* WARNING

This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with

cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K^+ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy. Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spiro-lactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+ . Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium[®] (triamterene, SK&F Co.), and

leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

SK&F CO., Carolina, P.R. 00630
Subsidiary of SmithKline Corporation

TRIAMTERENE CONSERVES POTASSIUM WHILE HYDROCHLOROTHIAZIDE LOWERS BLOOD PRESSURE

**BURROUGHS WELLCOME CO. MAKES
CODEINE COMBINATION PRODUCTS.
YOU MAKE THE CHOICE.**



**EMPIRIN[®]
COMPOUND
c CODEINE
#3**

Each tablet contains:
codeine phosphate, 32 mg (gr ½),
(Warning: May be habit-forming);
aspirin, 227 mg; phenacetin, 162 mg;
and caffeine, 32 mg.



**EMPRACET[™]
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#3**

Each tablet contains:
codeine phosphate, 30 mg (gr ½),
(Warning: May be habit-forming);
and acetaminophen 300 mg.



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3TH ANNUAL ARIZONA CHEST SYMPOSIUM

March 25-27, 1977, Doubletree Inn, Tucson, AZ. Sponsor: U of A College of Medicine Div. of Respiratory Section. Contact: Charles W. Otto, M.D., U of A College of Medicine, Tucson, AZ 85724. Approved for 20 required hours toward the ArMA Certificate in Continuing Medical Education.

DIAGNOSIS & TREATMENT OF CANCER — LATEST CLINICAL ADVANCES

March 25-26, 1977, Hyatt Regency Hotel, Phoenix, AZ. Sponsor: St. Joseph's Hospital & Medical Center. Contact: Kent J. Bossman, M.D., 350 W. Thomas Rd., Phoenix, AZ 85013. Approved for 10 required hours toward the ArMA Certificate in Continuing Medical Education.

INTERNATIONAL CARDIOVASCULAR CONGRESS I NON-INVASIVE DIAGNOSIS

March 28-30, 1977, Scottsdale Center for the Arts, Scottsdale, AZ. Sponsor: Arizona Heart Institute. Contact: Edward B. Methrich, M.D., 3800 N. Central, Phoenix, AZ 85012. Approved for 17 required hours toward the ArMA Certificate in Continuing Medical Education.

APRIL

CLINICAL CYTOPATHOLOGY FOR PATHOLOGISTS — POSTGRADUATE COURSE

April 11-22, 1977, Johns Hopkins Univ. School of Medicine. Johns Hopkins Univ. School of Medicine. Sponsor: Johns Hopkins Univ. School of Medicine & Johns Hopkins Hospital. Contact: John K. Frost, M.D., 610 Pathology Bldg., The Johns Hopkins Hospital, Baltimore, Maryland 21205. Before 2/28/77. Approved for 120 required hours toward the ArMA Certificate in Continuing Medical Education.

4TH ANNUAL MEETING OF SOUTHWESTERN SURGICAL CONGRESS

April 25-28, 1977, Acapulco, Mexico. Sponsor: Southwestern Surgical Congress. Contact: Jack A. Barney, M.D., Secy-treas. The Southwestern Surgical Congress, 708 Physicians & Surgeons Bldg., Oklahoma City, OK 73103.

2ND ANNUAL CONFERENCE NEONATAL-PERINATAL MEDICINE

April 21-23, 1977, Scottsdale Hilton Hotel, Scottsdale, AZ. Sponsor: Dist. VIII American College of Obstetricians & Gynecologists & Dist. VIII Nurses' Assoc. of Amer. College of Obstetricians and Gynecologists. Contact: L. Joseph Butterfield, M.D., Chairman, Perinatal Pediatrics Section Dist. VII, American Academy of Pediatrics, 1056 East Nineteenth Ave., Denver, CO 80218.

MONTHLY OR WEEKLY

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Society. Contact: Mrs. Mary Wood, 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 2 required hours per session toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tucson Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine & Dept. of IM, Dermatology Sect. Contact: Peter Lynch, M.D., U of A College of Medicine, Tucson, AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U of A College of Medicine, Dept. of Internal Medicine, Clinical Immunology Section. Contact: John Boyer, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd & 5th Thursday — Rm. N318, VA Hospital, 2nd & 4th Thursday, Rm. 6505, Tucson Medical Center. Sponsor: U of A College of Medicine, Department of Internal Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th Tuesdays — Rm. 6505, AZ Medical Center. 2nd & 4th Tuesdays — Rm. N318, Veterans Adm. Hospital. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Sidney Salmon, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

GRAND WARD ROUNDS — TRAUMA

Every Tuesday, 8 a.m. Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Surgery Dept., Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room 4410, Arizona Medical Center, Tucson, AZ. Sponsor: Division of Ophthalmology, U of A College of Medicine. Contact: H. E. Cross, M.D., Ph.D., Arizona Medical Center, Dept. of Surgery, Tucson, AZ. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd, & 5th Wednesday — Staff Conf. Rm., VA Hospital. 2nd & 4th Wednesday — Rm 5403, Arizona Medical Center. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Jay Smith, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm. 8403, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine Dept. of Psychiatry. Contact: Alan Levenson, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 1/2 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Dept. of Surgery, Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State Hospital, Phoenix, AZ. Sponsor: Arizona State Hospital. Contact: Howard E. Wulsin, M.D., Arizona State Hospital, 2500 E. Van Buren, Phoenix, AZ 85008. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

SURGICAL GRAND ROUNDS 4TH TUESDAY OF EACH MONTH

Hospital Auditorium, Baptist Hospital, Phoenix. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 6036 N. 19th Ave., Phoenix, AZ 85015. Approved for 1 1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE

Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CAMELBACK HOSPITAL CLINICAL CONFERENCE

3rd Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

COUNTER TRANSFERENCE GROUP

Weekly, Thurs. 8-10 p.m. Sponsor: Phoenix Psychiatric Council. Contact: James E. Campbell, M.D., 5051 N. 34th St., Phoenix, AZ 85018. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DESERT SAMARITAN HOSPITAL

Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Rosati, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS

Mondays — 12 Noon. D-5 North Conference Rm., Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE

3rd Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 926 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

BI-MONTHLY MEDICAL EDUCATION SEMINAR

Every other Wed. AM Begin 7/3/74. Maryvale Samaritan Hospital, Phoenix, AZ. Sponsor: Medical Staff Maryvale Hospital. Contact: Thomas J. Groves, M.D., 6037 W. Elm St., Phoenix, AZ 85033. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Third Monday of the Month, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 1201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS

Last Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U of A Medical Center, Dept. of Radiology. Contact: Irwin M. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE

1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MORBIDITY & MORTALITY CONFERENCE

2nd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. Good, M.D., Dir. Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CLINICAL PATHOLOGICAL CONFERENCE

4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

3rd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

GRAND ROUNDS

Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Spons. Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Centennial Medical Plaza, Suite 160, 1701 West Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.

A VALEDICTORY

JAMES O'NEILL, JR.

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"Unknown?"
I know them well.
Each one is an old, old friend.
One, for instance, is an old, bald-headed Master Sergeant, with hash
var up to his third rocker. He died in Italy, alone, but known by
untless thousands of infantrymen who owe their lives to what he
rsed them into doing and being.
Or . . .
He is the gentle, quiet kid who flew with me in Texas. I watched him
one morning, in a clear, bright sun-washed sky.
Or he is the bluff, arrogant boy fro Milwaukee who drilled all day in
e hot sun like an automaton and wrote to his mother every night. He
ad his Soldiers' Handbook and did push-ups while we were drinking
K beer.
He is the thoughtful, curious one who spoke of Nietzsche and Spinoza
d cried himself to sleep at night on a GI pillow.
He's one of those older fellows. The one, I think, who had four grown
ns in the Navy. He was a master plumber and was blown to shreds in
s workshop outside Bizerte.
He is the pink-cheeked farm kid whose mother "signed" for him. The
avy wired and told her he died so bravely. So well; so finally . . . In the
oral Sea. He had just turned 18. The name "Blanche" was tattooed
neath a heart on his left forearm. Blanche is his twin sister. He had
ver known any other girls . . .
He's that poor, bedraggled little guy in the over-sized fatigues, sweat-
ained and dirty, standing in a Georgia chow-line, swearing eternal
tred for warriors. But God how he could shoot!
He was the one who always got to the PX just after it closed.
He couldn't dig a hole, but he could lob a grenade like Walter
hanson. He died by that "sword" he wielded so well.
His daughter just turned 16. She was one when he died. She has his
es and her mother's memory of him.
He pressed his pants on a foot-locker, covered with a blanket. He sent
s pay home to a faithless child-bride and spent his last three seconds
earth falling across the muzzle of a German machine gun just this
le of a place called Bastogne.
He was the best crap-shooter in the Bronx, and the greatest lover in
ouisville, Ky.
He had planned to be a Rabbi.
He held a doctorate in English and abhorred the crudities of the
trine balladeers.
He left a line of healthy illegitimate children in a Detroit slum, and
ed heroically in Belgium.
He, whose grandfather had been born in slavery, saw Inchon through
ed eyes and bled to death on its beach.
He died as nobly as he could on the Yalu River. Weeping, he died, for
was all so futile and such a waste. He was 22 and very much in love.
is wife still weeps.
He is my brother. I knew him, though never well. We were both too
ung to know each other well. The world was too young to know him
ell, or what he might have done, had he not had to do something quite
fferent. But this is destiny. And dust.
He carried an onion-skin Shakespeare through a lush Pacific jungle.
l that was left of it when they found him were some torn pages; a few
nnets, Anthony's brief eulogy to dead Brutus. The Japanese had
molished the onion-skin Shakespeare and the man who bore it
avely into battle.
Ernie Pyle knew him. They damned the war together in a ditch on Ie
ima. He wept at Ernie's funeral and died the day after in yet another
ch.
Bill Mauldin knew him. George Baker knew him. Ray Clapper knew
m.
The fancy girls in Honolulu knew him and the old French priest who
ard his last confession in a monastery beyond Cherbourg knew him.
So how, then, are they "unknown"?
When you think of them today, and all the days of your life, think of
em as I do.
"Unknown?"
I know them well.
Each one is an old friend.

*Specially planned for physicians
working at the community level . . .*

DIAGNOSIS AND TREATMENT OF CANCER: LATEST CLINICAL ADVANCES

A symposium sponsored by the Department of
Radiation Oncology, St. Joseph's Hospital and
Medical Center, Phoenix, Ariz.; and the American
Cancer Society, Arizona Division.

March 25-26, 1977 — Phoenix, Arizona

THE FACULTY

- J. Robert Cassady, M.D.** Associate Professor,
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Milton Donaldson, M.D. Fox Chase Cancer Center.
Eli Glatstein, M.D. Assistant Professor of
Radiology, Division of Radiation Oncology,
Stanford University.
Martin B. Levene, M.D. Associate Professor of
Radiation Therapy, Harvard Medical School.
Steven Jones, M.D. Assistant Professor of
Medicine, Division of Medical Oncology,
University of Arizona.
Mark Nesbit, M.D. Professor of Pediatrics,
University of Minnesota.
Edwin Savlov, M.D. Associate Professor of
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Medicine.
William Sheehan, M.D. Associate Professor of
Pathology, University of Texas Southwestern
Medical School.
Jerome Urban, M.D. Chief, Breast Service,
Memorial Sloan-Kettering Cancer Center.

THE PROGRAM

- FRIDAY, MARCH 25**
NON-HODGKINS LYMPHOMAS (morning)
Drs. Jones, Glatstein, Sheehan; panel discussion.
CHILDHOOD CANCER (afternoon)
Drs. Cassady, Donaldson, Nesbit
SATURDAY, MARCH 26
BREAST CANCER (morning)
Drs. Jones, Levene, Savlov, Urban
(Remainder of weekend free for rest and recreation
in the Valley of the Sun.)

REGISTRATION: \$75 for entire symposium, or \$25 per half-day
session. Please make check payable to St. Joseph's Hospital
and Medical Center; and mail to: St. Joseph's H&MC, Attn.,
Kent J. Rossman, M.D., Director, Department of Radiation
Oncology, P.O. Box 2071, Phoenix, Ariz. 85001. Registrants
requiring hotel reservations will receive reservation request
form directly from the new Hyatt Regency.



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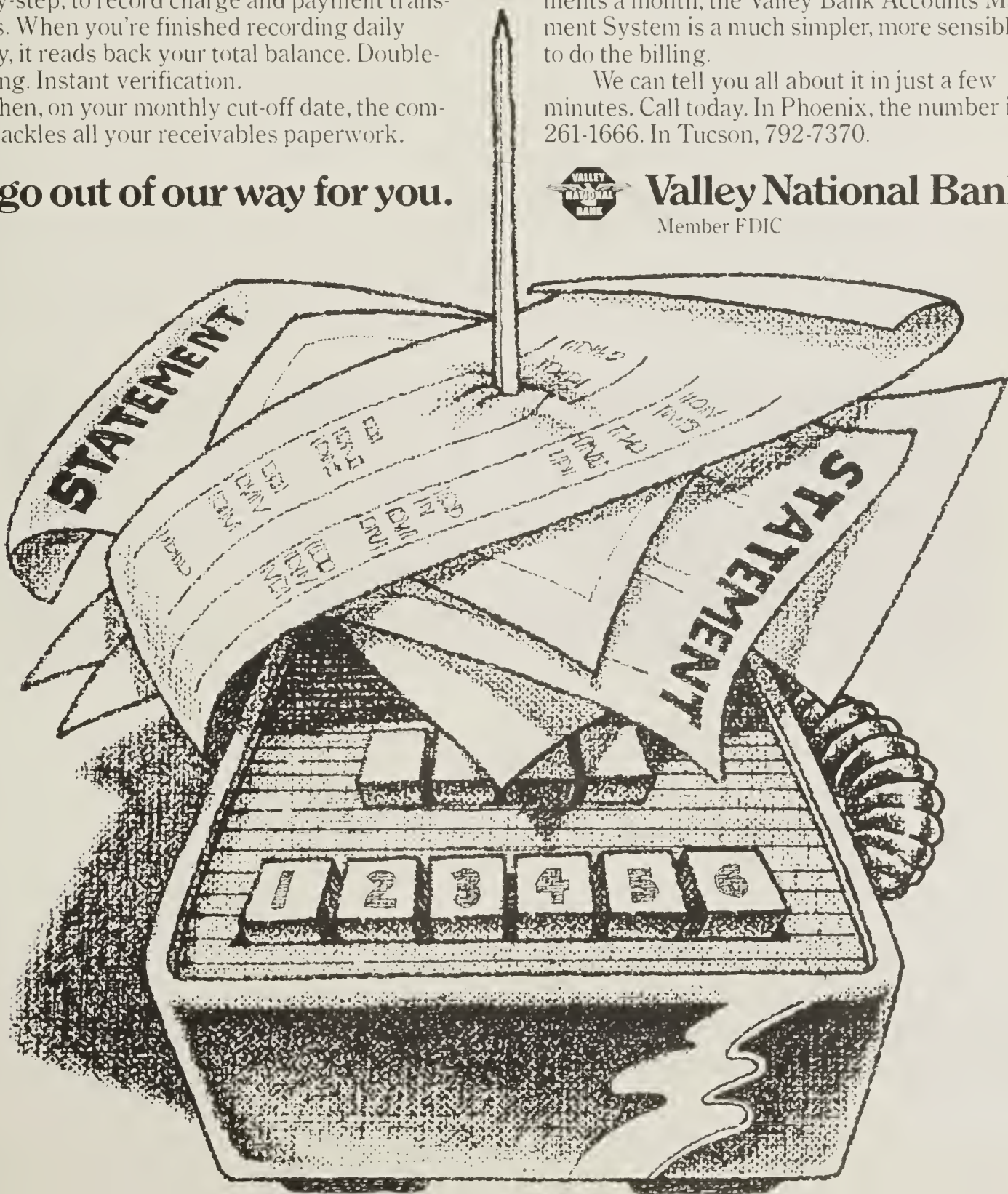
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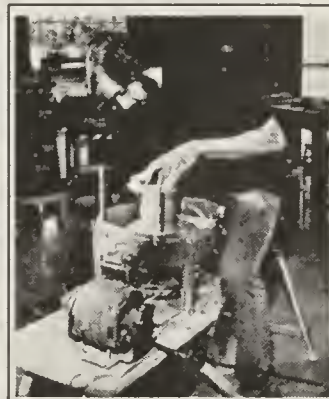
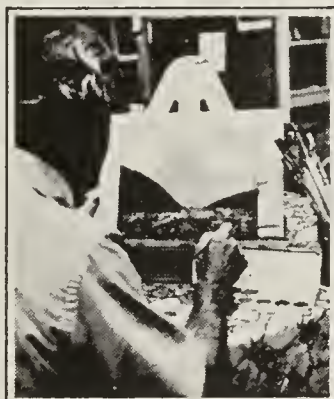
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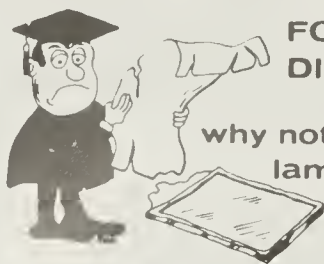


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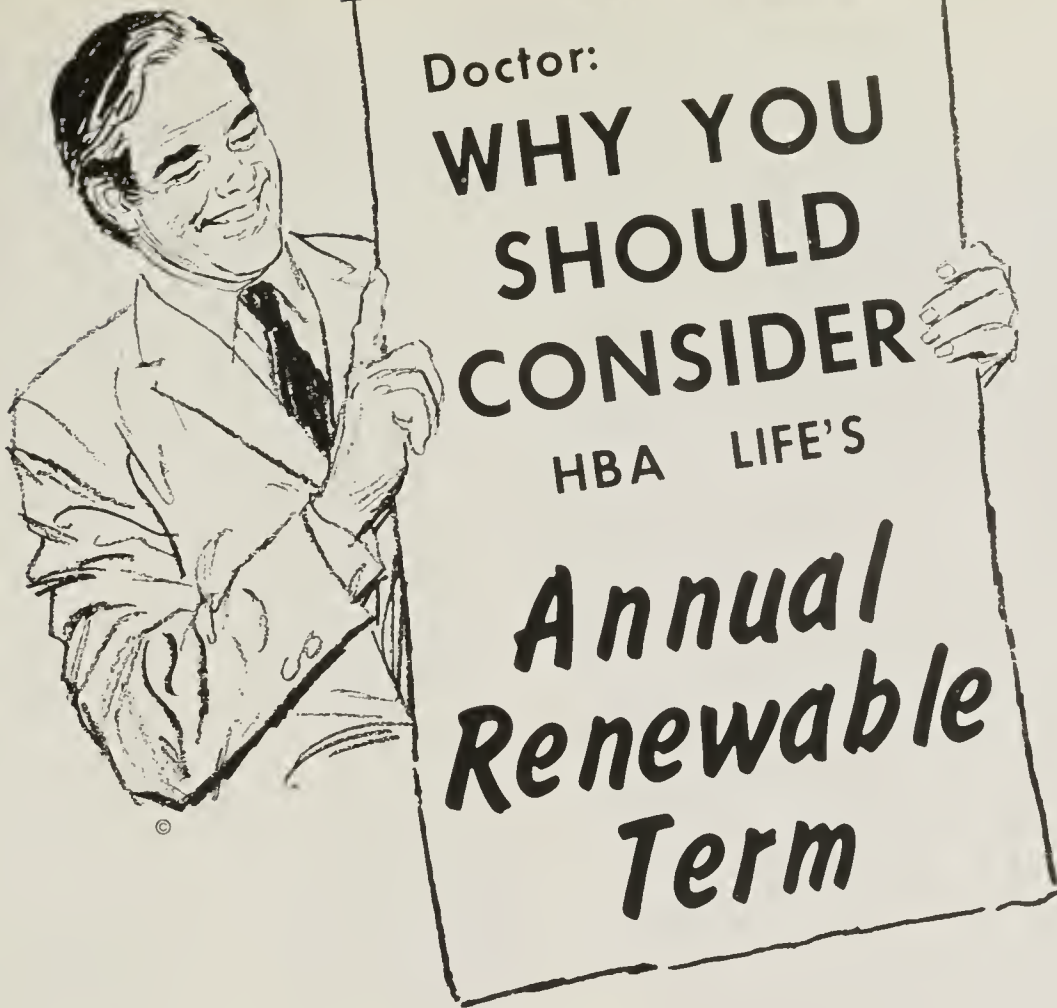
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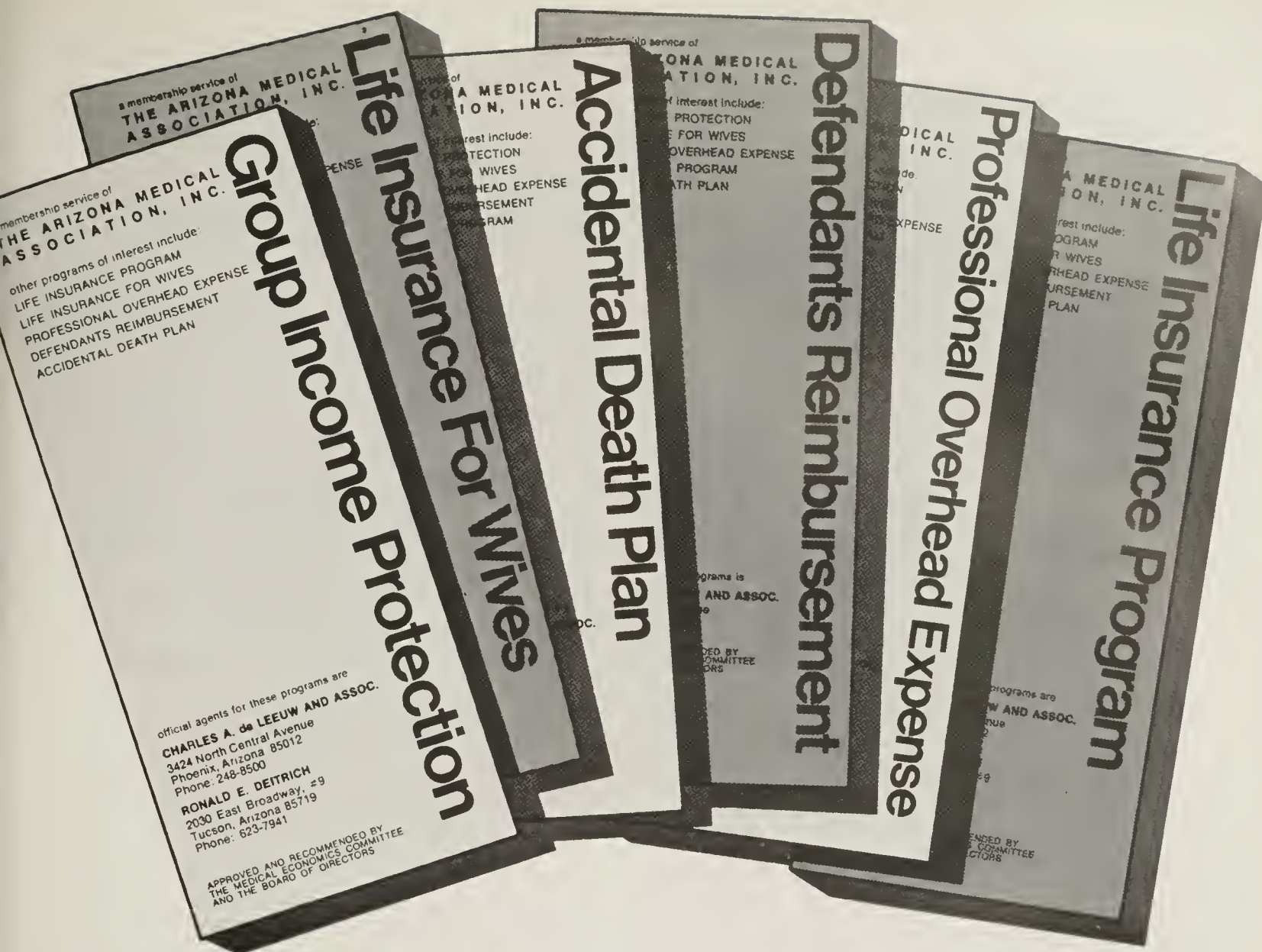
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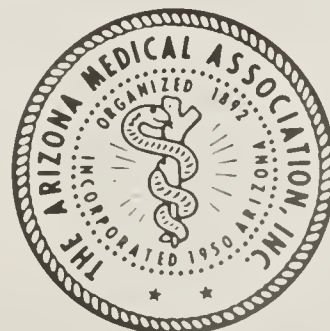
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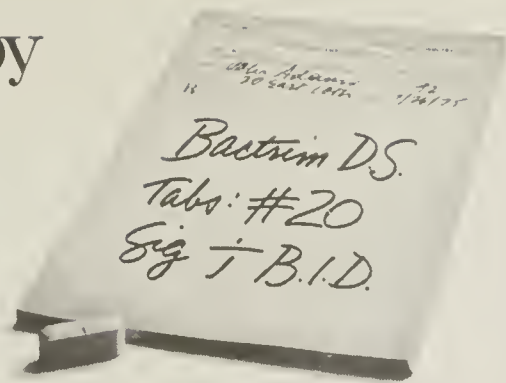
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10-day Bactrim therapy outperforms 10-day ampicillin therapy.



In a multicenter, double-blind study of patients with chronic or frequently recurrent urinary tract infection, Bactrim 10-day therapy outperformed ampicillin 10-day therapy by 27.2%, when comparing patients who maintained clear cultures for eight weeks. Criterion for "clear culture" was 1000 or fewer organisms/ml of urine.

While adverse reactions noted in this study were mild (e.g., vomiting, nausea, rash), more serious reactions can occur with these drugs. See manufacturer's product information for complete listing. Maintain adequate fluid intake; perform frequent CBC's and urinalyses with microscopic examination.

Note: Bactrim tablets were used in these clinical trials. Bioequivalency studies show one Bactrim DS double strength tablet is equivalent to two Bactrim tablets.

For chronic or frequently recurrent cystitis and pyelonephritis due to susceptible organisms.

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Chronic urinary tract infections evidenced by persistent bacteriuria (symptomatic or asymptomatic), frequently recurrent infections (relapse or reinfection), or infections associated with urinary tract complications, such as obstruction. Primarily for cystitis, pyelonephritis or pyelitis due to susceptible strains of *E. coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris* and *Proteus morganii*.

NOTE: The increasing frequency of resistant organisms limits the usefulness of antibacterials, especially in these urinary tract infections. The recommended quantitative disc susceptibility method (*Federal Register*, 37:20527-20529, 1972) may be used to estimate bacterial susceptibility to Bactrim. A laboratory report of "Susceptible to trimethoprim-sulfamethoxazole" indicates an infection likely to respond to Bactrim therapy. If infection is confined to the urine, "Intermediate susceptibility" also indicates a likely response. "Resistant" indicates that response is unlikely.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; pregnancy; nursing mothers.

Warnings: Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted. **Data are insufficient to recommend use in infants and children under 12.**

Precautions: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. *Blood dyscrasias:* Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprolthrombinemia and methemoglobinemia. *Allergic reactions:* Erythema

multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. *Gastrointestinal reactions:* Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea and pancreatitis. *CNS reactions:* Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. *Miscellaneous reactions:* Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for children under 12. Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days.

For patients with renal impairment:

Creatinine Clearance (ml/min)	Recommended Dosage Regimen
Above 30	Usual standard regimen
15-30	1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) every 24 hours
Below 15	Use not recommended

Supplied: Double Strength (DS) tablets, each containing 160 mg trimethoprim and 800 mg sulfamethoxazole, bottles of 100; Tel-E-Dose® packages of 100. Tablets, each containing 80 mg trimethoprim and 400 mg sulfamethoxazole — bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 40, available singly and in trays of 10.

Oral suspension, containing in each teaspoonful (5 ml) the equivalent of 40 mg trimethoprim and 200 mg sulfamethoxazole; fruit-licorice flavored — bottles of 16 oz (1 pint).

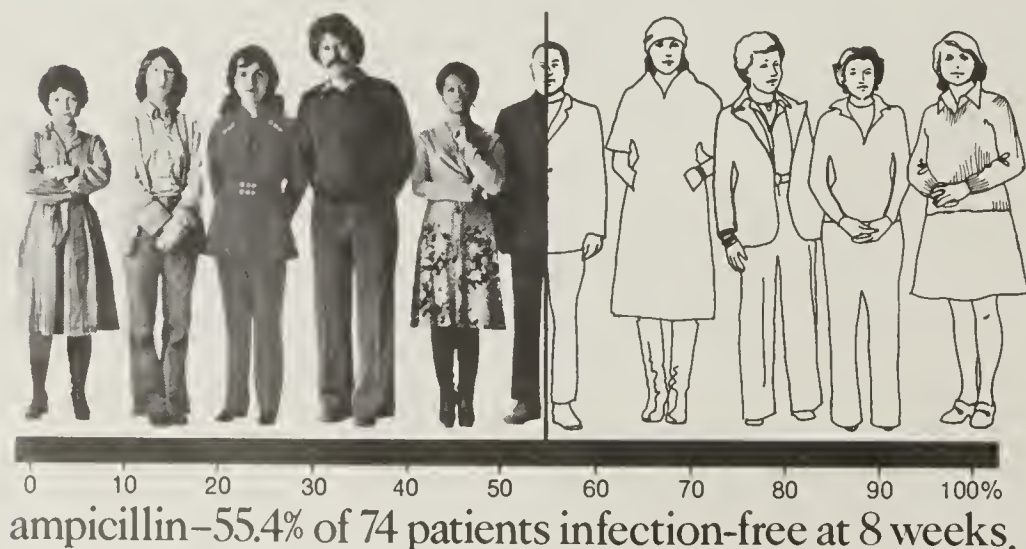
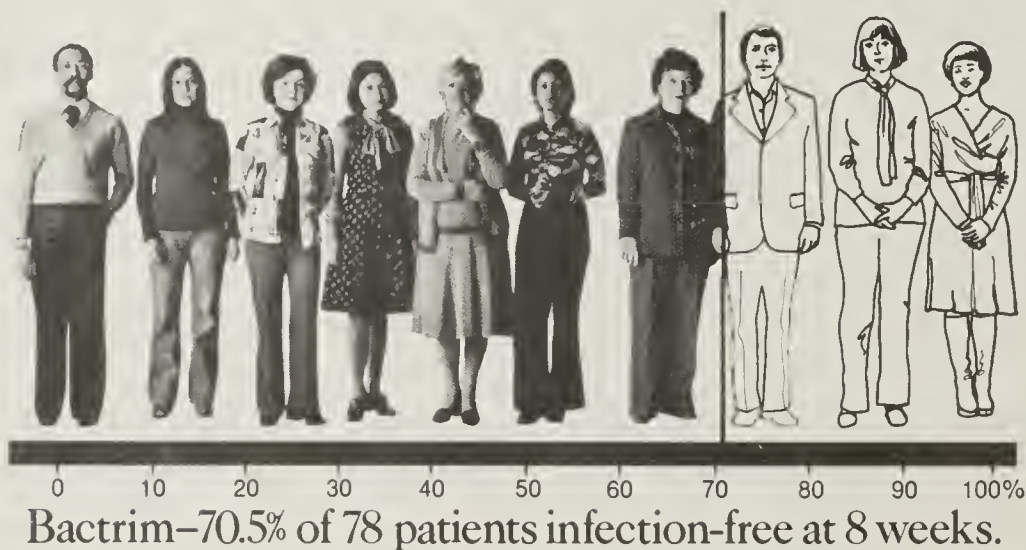


Roche Laboratories
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110

In a multicenter study of patients with urinary tract infections

THE LIBRARY, ACQUISITIONS DIV.
U. OF CALIF., S.F.
SAN FRANCISCO, CA 94143

Bactrim effective in keeping patients infection-free for 8 weeks.[†]



*This percentage is arrived at by the statistical method of dividing the difference between Bactrim and ampicillin results (15.1%) by the percent of ampicillin results (55.4%).

†Data on file, Hoffmann-La Roche Inc., Nutley, New Jersey 07110

BactrimTM DS

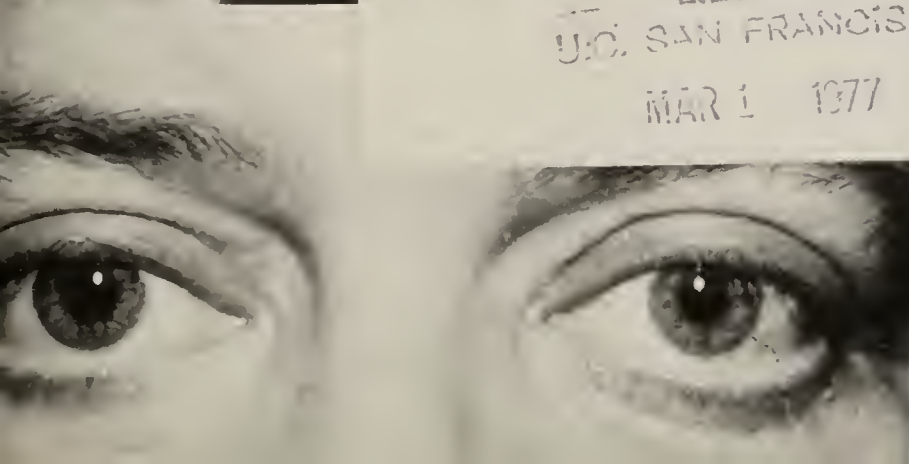
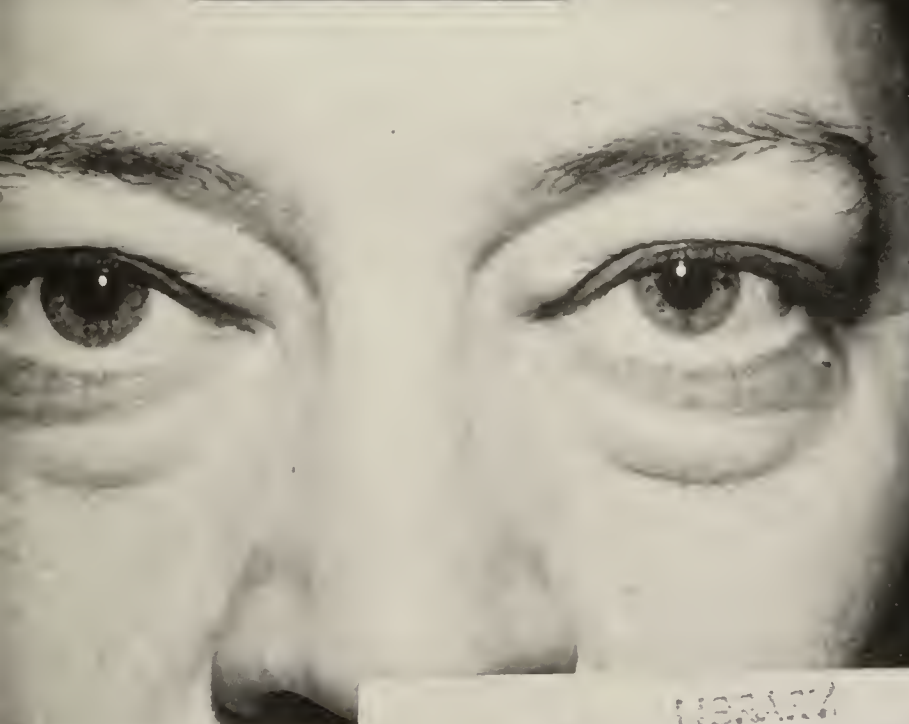
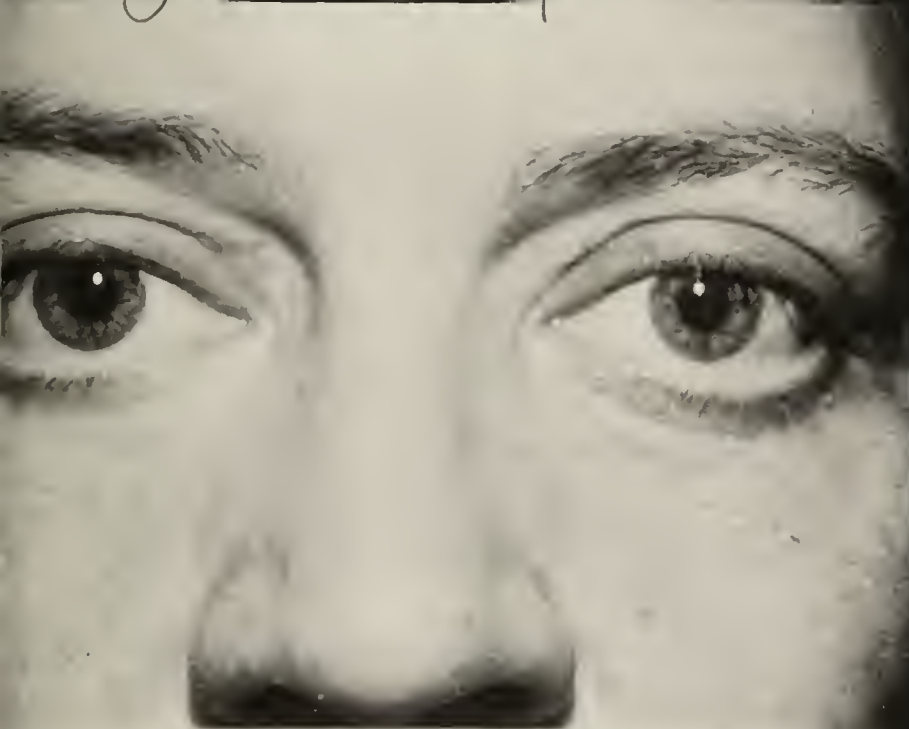
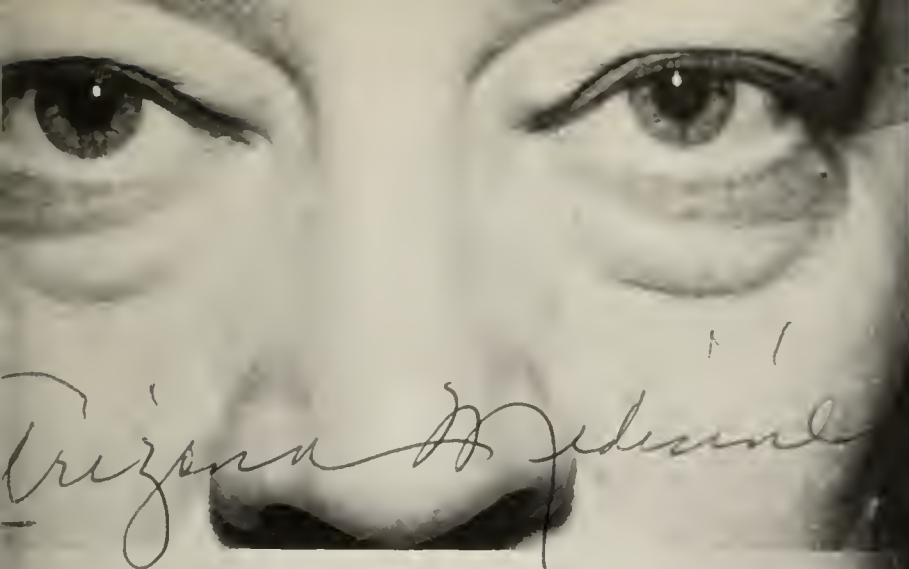
(160 mg trimethoprim and 800 mg sulfamethoxazole)

Double Strength tablets Just 1 tablet B.I.D.

Note: Bactrim tablets were used in these clinical trials. Bioequivalency studies show one Bactrim DS double strength tablet is equivalent to two Bactrim tablets.

Please see summary of product information on preceding page.

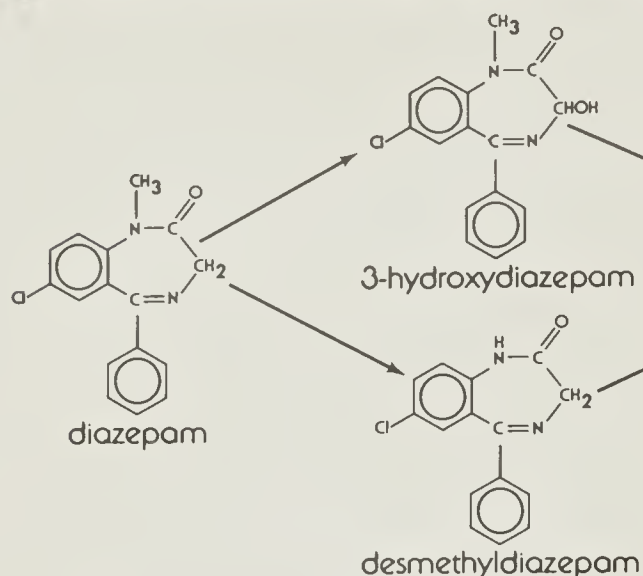
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MAR 1 1977

ARIZONA
MEDICINE

A pharmacokinetic character all its own



Valium (diazepam) is a benzodiazepine with a distinctive pharmacokinetic profile

The pharmacokinetic profile of Valium is one of the characteristics that sets it apart from other benzodiazepines. Consider, in particular, the metabolic pathway of Valium. The three major metabolites of Valium exhibit significant pharmacologic activity—and so, of course, does the parent substance—diazepam itself. All combine to produce the characteristic clinical response seen with Valium. The response you have come to know, to want and to trust.

Pharmacokinetic studies also demonstrate that Valium has a pattern of absorption, distribution, metabolism and elimination that is reliable and consistent. And, although the pharmacokinetics of a drug cannot, at present, be specifically related to its clinical effects, it is clearly a factor that distinguishes one product from another by providing important insights into how each moves through the patient's body.

Valium® (diazepam) ^{IV}

2-mg, 5-mg, 10-mg scored tablets
**a prudent choice in psychic
tension and anxiety**

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due

to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome; convulsive disorders (not for sole therapy).

Contraindicated:

Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma;

may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients.

Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



Roche Laboratories
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110



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Tucson & Yuma areas – Ask operator for Enterprise 269

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IF YOU HAVE A HARD TIME
TELLING **LETTER**[®] FROM SYNTHROID[®]
(Sodium Levothyroxine, U.S.P.) (Sodium Levothyroxine, U.S.P.)

MAYBE YOU NEED A SCORECARD

T-4
SCORECARD

LETTER **SYNTHROID**
(Sodium Levothyroxine, U.S.P.) (Sodium Levothyroxine, U.S.P.)

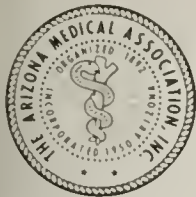
Sodium Levothyroxine, U.S.P.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Less Expensive* <i>(costs 1090 less)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Potency-Coded Tablets	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Color-Coded Tablets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scored Tablets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7 Tablet Potencies <i>(0.15 mg in new)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

* As compared to Synthroid (Sodium Levothyroxine, U.S.P.)

LETTER[®]
(Sodium Levothyroxine, U.S.P.)

Armour Pharmaceutical Company, Phoenix, Arizona 85001





FEBRUARY 1977/Vol. 34, No. 2

ARIZONA MEDICINE

JOURNAL OF ARIZONA MEDICAL ASSOCIATION

MEDICAL SOCIETY OF THE UNITED STATES AND MEXICO

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Published monthly by The Arizona Medical
Association, Inc., with offices at 810 W.
Many Home Rd., Phoenix, Arizona 85013.
Subscription \$20 a year, single copy \$2.00.
Second class postage paid at Phoenix, Ari-
zona, and at additional mailing offices.



RECENT CHANGES

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to Physicians

Informational
Bulletin #433-76

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special report
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bulletin**

**Health care doesn't
need more red tape**

**Drug firms challenge
'MAC' rules**

**Drug
Substitution**

The Constant Denominator
of Health Progress
RESEARCH

Mailgram

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.

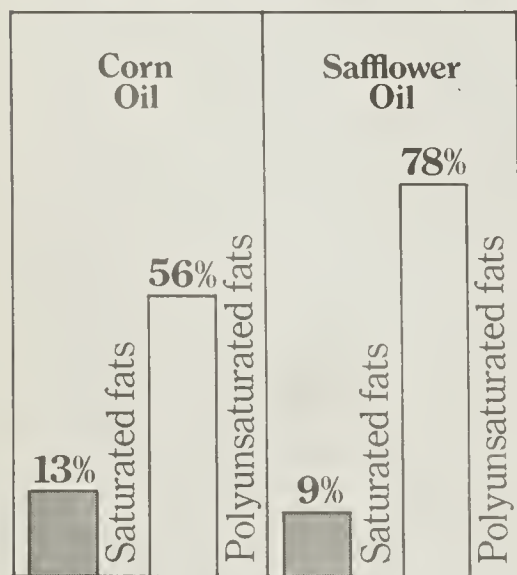


Pharmaceutical Manufacturers Association
1155 Fifteenth Street, N.W., Washington, D.C. 20005

The margarine highest in polyunsaturates doesn't contain a drop of corn oil.

Shouldn't you spread that around?

Saturated fats and polyunsaturated fats in Corn and Safflower Oils



All Saffola products have earned the
Good Housekeeping Seal.

Saffola is made with liquid safflower oil. It's higher in polyunsaturates than either Fleischmann's or Mazola. And no margarine is lower in saturated fats. Saffola contains no cholesterol.

Your patients will be pleased to know that Saffola, as part of a modified fat diet, is a delicious way to help reduce serum cholesterol.

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Enjoy it to your heart's content.

consider the effect on
coexisting diabetes when
you prescribe a vasodilator*



(POSTERIOR VIEW OF PANCREAS)

no interference in the management of the diabetic patient has been reported with

VASODILAN[®]

(ISOXSUPRINE HCl)

the compatible vasodilator

TABLETS, 20 mg.

***Indications:** Based on a review of this drug by the National Academy of Sciences-National Research Council and/or other information, the FDA has classified the indications as follows:
Possibly Effective:
1. For the relief of symptoms associated with cerebral vascular insufficiency.
2. In peripheral vascular disease of arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's Disease) and Raynaud's disease.
Final classification of the less-than-effective indications requires further investigation.

Composition: Vasodilan tablets, isoxsuprine HCl, 10 mg. and 20 mg.
Vasodilan injection, isoxsuprine HCl, 5 mg., per ml.

Dosage and Administration: Oral: 10 to 20 mg., three or four times daily
Intramuscular: 5 to 10 mg. (1 or 2 ml.) two or three times daily. Intramuscular administration may be used initially in severe or acute conditions.

Contraindications and Cautions: There are no known contraindications to oral use when administered in recommended doses. Should not be given immediately postpartum or in the presence of arterial bleeding.

Parenteral administration is not recommended in the presence of hypotension or tachycardia.

Intravenous administration should not be given because of increased likelihood of side effects.

Adverse Reactions: On rare occasions oral administration of the drug has been associated in time with the occurrence of hypotension, tachycardia, nausea, vomiting, dizziness, abdominal distress, and severe rash. If rash appears the drug should be discontinued.

Although available evidence suggests a temporal association of these reactions with isoxsuprine, a causal relationship can be neither confirmed nor refuted.

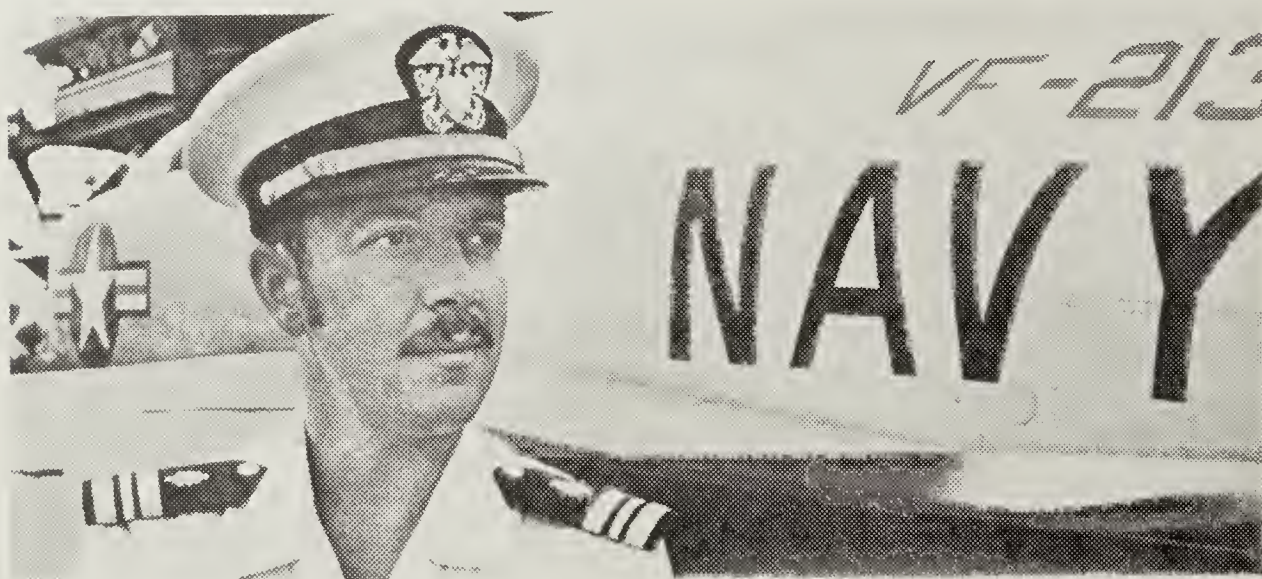
Administration of single dose of 10 mg. intramuscularly may result in hypotension and tachycardia. These symptoms are more pronounced in higher doses. For these reasons single intramuscular doses exceeding 10 mg. are not recommended. Repeated administration of 5 to 10 mg. intramuscularly at suitable intervals may be employed.

Supplied: Tablets, 10 mg., bottles of 100, 1000, 5000 and Unit Dose; Tablets, 20 mg., bottles of 100, 500, 1000, 5000 and Unit Dose; Injection, 10 mg. per 2 ml. ampul, box of six 2 ml. ampuls.

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Medicine and adventure...plus a new pay increase.



Now with the new medical supplemental pay bill, many physicians in military service may qualify for bonuses of up to \$13,500 per year on top of their normal pay and allowances. Depending on a review of particular circumstances, this can be translated into incomes in the \$30,000 to \$40,000 range!

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It pays to look into Navy Medicine.



“I Cannot Tell A Lie—It Does Taste Like BANANAS!”

When acute, non-specific diarrhea causes the stomach to revolt, the tasteful counterattack is Donnagel®-PG. Donnagel-PG provides all the benefits of paregoric and—instead of that unpleasant paregoric taste—a delicious banana flavor good enough to make even an expert flip his wig.

Now with child-proof closure

Donnagel®-PG[©]

Donnagel with paregoric equivalent

For diarrhea

Each 30 ml. contains:

Kaolin	6.0 g.
Pectin	142.8 mg.
Hyoscyamine sulfate	0.1037 mg.
Atropine sulfate	0.0194 mg.
Hyoscine hydrobromide	0.0065 mg.
Powdered opium, USP	24.0 mg
(equivalent to paregoric 6 ml.)	
(warning: may be habit forming)	
Sodium benzoate	60.0 mg
(preservative)	
Alcohol, 5%	

A·H·ROBINS

A.H. Robins Company, Richmond, Virginia 23220

Member of Certified Medical Representatives Institute

COUGHS ARE BACK



CLEAR THE TRACT

in coughs of colds,
"flu" and u.r.i. —
clear the tract
with the famous
Robitussin® Line!

The 5 members of the Robitussin® family all contain the expectorant, guaifenesin, to help clear the lower respiratory tract. Guaifenesin works systemically to help stimulate the output of lower respiratory tract fluid. This enhanced flow of less viscid secretions promotes ciliary action and makes thick, inspissated mucus less viscid and easier to raise. As a result, dry, unproductive coughs become more productive and less frequent.

For productive and unproductive coughs

Robitussin®

Each 5 ml teaspoonful contains:
Guaifenesin, NF 100 mg
Alcohol, 3.5%

For severe coughs

Robitussin A-C®

Each 5 ml teaspoonful contains:
Guaifenesin, NF 100 mg
Codeine Phosphate, USP 10.0 mg
(warning: may be habit forming)
Alcohol, 3.5%

Non narcotic for 6-8-hour cough control

Robitussin-DM®

Each 5 ml teaspoonful contains:
Guaifenesin, NF 100 mg
Dextromethorphan
Hydrobromide, NF 15 mg
Alcohol, 1.4%

Decongests nasal passages and sinus
openings as it helps relieve coughs

Robitussin-PE®

Each 5 ml teaspoonful contains:
Guaifenesin, NF 100 mg
Pseudoephedrine
Hydrochloride, NF 30 mg
Alcohol, 1.4%

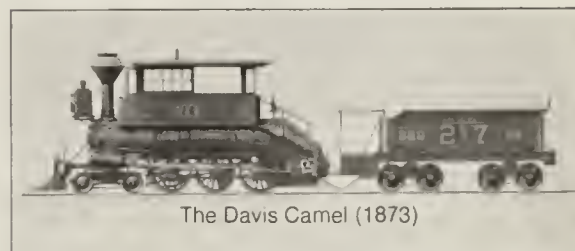
Decongestant action helps control cough and
clear stuffy noses and sinuses. Non narcotic.

Robitussin-CF®

Each 5 ml teaspoonful contains:
Guaifenesin, NF 50 mg
Phenylpropanolamine
Hydrochloride, NF 12.5 mg
Dextromethorphan
Hydrobromide, NF 10 mg
Alcohol, 1.4%

All Robitussin formulations available on your
Rx or Recommendation.

For many years Robins has spotlighted the expectorant action of the Robitussin cough formulations by featuring action photographs of steam engines like the one on the preceding page. In keeping with this tradition, last year the company commissioned a well-known illustrator to render full-color drawings of several classic locomotives . . . accurate to the minutest detail. Chances are you requested and received the first locomotive in this series, The William Mason, last winter. Now, the second one is available. (See below). To order your print suitable for framing, write "Robitussin Clear-Tract Engine #2" on your Rx pad and mail to "Vintage Locomotives," Dept. T4, A. H. Robins Company, 1407 Cummings Drive, Richmond, Va. 23220.



The Davis Camel (1873)

OUR PHOTO: Norfolk & Western Branch Train
No. 202 west bound near Alvarado, Va (Oct., 1956).
This line reaches the highest point of any railroad
East of the Rockies (elevation 3,577 ft.) with a
minimum grade of 3%. It crosses 108 bridges,
some 700 ft. long! Photo by O. Winston Link.

A.H. ROBINS

A. H. Robins Company, Richmond, Va. 23220

All oral bronchodilators are pretty much the same. Right? Wrong!

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See next page for brief summary

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THE AGING EYELID

ROBERT RUBENZIK, M.D.

This discussion of special eyelid problems is a timely one due to the increasing population of elderly patients.

As we age, our bodies undergo change. Our skin becomes thinner, perhaps wrinkled; ligaments stretch; connective tissue septa become atrophic, allowing the subcutaneous fat to bulge. One of the structures most vulnerable to the aging process is the eyelid. When the lids fail to protect the globe, ocular damage results. When the upper lid droops excessively, visual loss results. And when the lacrimal drainage system is distorted, tearing and chronic infection set in. The most common manifestations of the aging process which affect the eyelids are blepharochalasis, ptosis, entropion, and ectropion.

There is a controversy in the oculo-plastic literature regarding the term blepharochalasis. Some say that this term should be reserved for a post-inflammatory condition seen in young people, while the common changes we see in our older patients should be called dermatochalasis. Suffice it to say that when most of us use the term blepharochalasis we are describing the wrinkled skin and protruding orbital fat characteristic of the aging process. The upper and lower lids are similarly affected. The process is caused by a thinning and yielding of the orbital septum, which allows the orbital fat to protrude into the substance of the lids, producing the so-called "bags". In the process, the skin becomes stretched and may become quite excessive, forming folds and wrinkles. Blepharochalasis is usually of cosmetic concern; rarely the overhanging fold of upper lid skin will cover the pupil, obscuring vision.

The treatment of blepharochalasis consists of the removal of excess orbital fat combined with a judicious excision of lid skin. When adequate amounts of fat are removed and the skin resected and tightened to an appropriate degree, a gratifying result follows (Fig. 1).



Figure 1

Upper photo depicts changes typical of blepharochalasis in a 50 year-old woman. Lower photo was taken 3 months after cosmetic blepharoplasty.

Several varieties of ptosis exist. Congenital ptosis is rare, is usually associated with limited movement of the affected lid, and is not due to aging. The ptosis of Horner's syndrome is likewise an entity unto itself. The more common "senile" ptosis is characterized by a constant droop of the upper lid usually associated with excellent levator muscle action (good lid movement). In most cases it is probably



Figure 2

Upper photo shows ptosis of the right upper lid in a 70 year-old man. Lower photo shows result 2 months after levator aponeurosis repair.

secondary to atrophic changes in the aponeurosis of the levator muscle (the aponeurosis is the fascia that connects the levator muscle to the lid). The aponeurosis may develop holes, dehiscences, or may simply stretch and allow the lid to droop. As in blepharochalasis, minor amounts of ptosis are cosmetic in nature. When the lid margin drops below the level of the pupil, repair is indicated for restoration of sight.

Ptosis repair consists of shortening (or repairing) the elevators of the lid. The two sources of elevating power for the upper lid are Mueller's muscle, which is sympathetically innervated, and the levator, which is voluntary. Either or both of these may be shortened (Fig. 2). Judgement must be used when raising the ptotic upper lid lest corneal exposure result.

I feel that senile lower lid entropion and ectropion are varieties of the same basic condition. The entire lid becomes lax, so that it is not held tightly against the



Figure 3

A. Lower lid is in normal position, but the lower lid retractor is lax. B. An ectropion exists when the lid falls away from the eye until checked by the retractor, now taut. C. An entropion results if the lower border of the tarsus falls away from the eye while the lid margin rolls inward, abrading the cornea.

eyeball. At the same time the connective tissue structures which normally hold the lid in an upright position stretch and loosen. The lid margin is free to turn out, forming an ectropion, or to turn in, forming an entropion (Fig. 3). Entropion and ectropion are common. They should not be considered cosmetic blemishes; they are functionally serious problems.

When an entropion develops the lashes are free to abrade the cornea. This is quite irritating, and the patient with an entropion often exhibits a marked degree of blepharospasm. This is not the source of the entropion, but is the result of the corneal abrasion.

Patients with ectropion often complain of tearing. They tear because the puncta (openings into the lacrimal drainage system) are no longer in their normal position against the eyeball. The tears well up behind the ectropic lid and run over the lid margin. Stasis develops in this



Figure 4

Upper photo shows a senile ectropion of the lower lid. Lower photo shows the same eye after horizontal tightening.

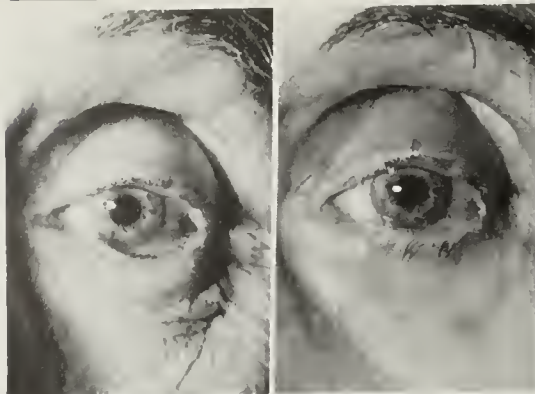


Figure 5

Left photo shows a senile entropion of the lower lid. Right photo shows the same eye after horizontal tightening.

tends to prevent malposition (Figs. 4 and 5). Another technique involves tightening the lower lid retractors. These are the fascial structures which exert a vertical pull on the lower lid and hold it straight. I prefer the horizontal tightening as my procedure of choice; however, there is no question that both methods work.

In the patient who refuses surgery or who represents a poor surgical risk, sutures may be placed in the lid to effect a rotation of the lid margin to a favorable position. This seems to work better in entropion repair than in ectropion repair. The sutures are placed at an appropriate angle through the lid so that their pull tends to set the lid straight (Fig. 6).

In summary, the eyelid changes which characterize the aging process may preclude normal function of the eyes. These changes relate mainly to atrophy and



Figure 6

Placement of suture for correction of entropion. When the suture is pulled tight, the lid margin is everted away from the cornea. Usually a row of 4 such sutures is placed across the lid.

stretching of the lid skin and connective tissue, and are generally amenable to therapy.

Bibliography available upon request.

CLINICAL SPECTRUM OF THE SICK SINUS SYNDROME

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ALBERTO BENCHIMOL, M.D.

KENNETH B. DESSER, M.D.

ABSTRACT-SUMMARY

Bradycardia due to sinus node dysfunction is frequently a cause of syncope or lightheadedness in the elderly. It may be diagnosed after exclusion of other diseases which are known to present with the same symptoms. The diagnosis can be proved in most instances by estimation of the sinus node recovery time after atrial pacing. Satisfactory therapeutic results

are obtained with right ventricular endocardial pacing. For those instances of bradycardia-tachycardia syndrome, the use of antiarrhythmic agents combined with ventricular pacing provides the most appropriate form of treatment.

Bradycardia due to complete atrio-ventricular block and its attendant symptoms are well recognized. However, it has been known for several years that syncopal episodes can similarly result as a consequence of extreme sinus bradycardia. The development of electrical pacing and increased availability of the extra-stimulus technique have provided tools for the investigation of various electrophysiological phenomena. Unexplained bradycardia of sinus origin is being noted with increasing frequency as a cause of lightheadedness and fainting, especially in elderly subjects. Paradoxically, some of these patients have recurrent episodes of supraventricular tachycardia alternating with the bradycardia. Terms such as "sick sinus syndrome", "sinoatrial syncope", "lazy sinus syndrome", and "bradytachy

syndrome" have been applied to describe sinus nodal dysfunction that occurs in such patients.

ANATOMY OF THE SINUS NODE

The sinus node was first described by Keith and Flack in 1906. Being sub-pericardial in location, the node is vulnerable to trauma incurred during cardiac surgical procedures and involvement by inflammatory processes affecting adjacent areas. Its blood supply is derived from the right coronary artery in 60% of cases and from the left circumflex coronary artery in the other 40%. Transient sinus nodal dysfunction therefore, frequently occurs in the presence of right coronary artery disease. The matrix of the node is composed of elastic and collagenous fibers which are thought to increase with age at the expense of the functioning cells. This latter phenomenon may be one explanation for sinus bradycardia, which is frequently encountered in the elderly.¹

Degenerative intranodal changes are

Submitted for publication 11/77.
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Supported in Part by the E. Nichols and Kim Sigsworth Memorial Funds and The Institute for Cardiovascular Diseases, Inc.
Reprint requests to: Alberto Benchimol, M.D. Good Samaritan Hospital, P. O. Box 2989, Phoenix, Arizona 85062.

also seen in cases of long standing atrial fibrillation, familial atrial fibrillation associated with otosclerosis and the hereditary Q-T interval syndromes that are harbingers of sudden death.²

SINUS NODE ELECTROPHYSIOLOGY AND FUNCTION

The sinus node functions as an electrical generator by virtue of its property of spontaneous diastolic depolarization and is the dominant pacemaker for the heart because it has the highest rate of discharge.³ Thus it suppresses subsidiary pacemakers at other cardiac sites which normally do not usurp control of the atria or ventricles unless the sinus node defaults. Pacemaking sites within the sinus node itself, however, may shift from one group of cells to another thereby providing a mechanism for phenomena such as sinus arrhythmia and sinus extrasystoles.⁴

The safety margin at which the sinus node functions as an electrical generator is high because of its large number of cells with properties of automaticity. This anatomic arrangement is such that if one group of cells fails, another assumes the pacemaking responsibilities.⁵ The propagation of impulses through the sinus node, however, is extremely slow as compared to the ordinary atrial myocardium. Therefore, it is possible that sinoatrial conduction fails more often than sinus node impulse generation though the result in both instances is absence of atrial activation as evidenced by absent P waves on the electrocardiogram. This highlights the difficulty in distinguishing between sinus arrest (failure of impulse generation) and sino-atrial exit block (failure of generated impulse propagation), (Figure 1).

M.B. - SINUS ARRHYTHMIA - POSS. S.A. WENCKEBACH
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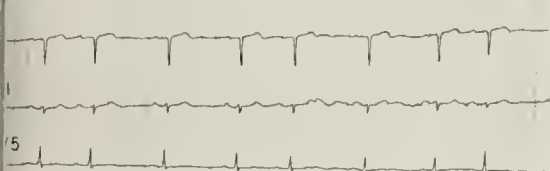


Figure 1

Simultaneously recorded leads V¹, II and V⁵ in a 68 year old woman with the sick sinus syndrome. P-P cycles, unrelated to respiration, result in paired beats separated by single beats. Such findings strongly suggest 3:2 and 2:1 sinoatrial Wenckebach block.

CAUSES AND CLINICAL FEATURES OF THE SICK SINUS SYNDROME

Lown⁶ first coined the term "sick sinus syndrome" to describe a variety of rhythm disturbances such as chaotic atrial activity, changing P wave contour, bradycardia, atrial or A-V junctional tachycardia following the D.C. cardioversion of chronic atrial fibrillation. Ferrer⁷ broadened the term to include unexplained chronic sinus bradycardia, brief or sustained sinus

E M - 99 F BRADYCARD. JEB

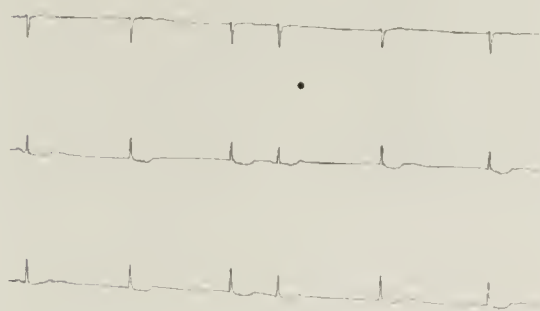


Figure 2

Simultaneously recorded leads V¹, II and V⁵ in a symptomatic 99 year old woman with the sick sinus syndrome. Note marked sinus bradycardia with a slow A-V junctional escape rhythm.

arrest, and sinus pauses due to sino-atrial exit block (not drug induced) with atrial or junctional escape rhythms. Default of these latter subsidiary pacemakers resulting in total cardiac asystole, chronic atrial fibrillation and finally alternating bradycardia and tachycardia was likewise recognized, (Figures 2 and 3).

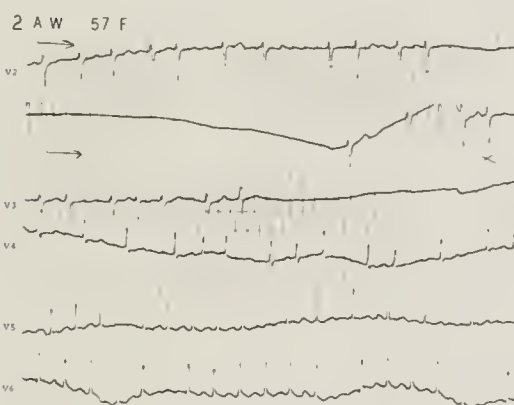


Figure 3

Leads V² - V⁶ in a 57 year old woman with syncope and the "brady-tachy" syndrome. Note the presence of atrial fibrillation and periods of cardiac standstill. The latter suggests disease of the lower "escape" pacing centers.

Bradycardiac rhythm disturbances, though infrequently mentioned in association with cardiomyopathies, are occasionally observed.⁸ Amyloid deposits have been demonstrated in the hearts of some family members with persistent atrial standstill. Occlusive disease of the sinus node artery has been incriminated in other cases. In a recent review of the subjects, a specific search was made for involvement of the sinus node artery in symptomatic bradycardiac subjects with demonstrable dysfunction, yet vascular involvement was infrequently found.⁹ Friedreich's ataxia, progressive muscular atrophy, collagen diseases, infiltrations due to metabolic disturbances such as hemochromatosis and metastatic deposits have all been described in association with sinus dysfunction.¹⁰ Degenerative changes of the sinus node are occasionally seen in the heritable prolonged Q-T interval syndromes.² However, many regard these

latter disorders as autonomic disturbances. Transient sinus dysfunction is observed in association with acute myocardial infarction.¹¹ While destruction of the sinus node in association with atrial infarction may be uncommon, the bradycardia and hypotension frequently noted in the presence of acute inferior wall infarction is thought to be due to an exaggerated vagal reflex (Jarisch-Bezold reflex). Ischemia of the sinus node or of the cholinergic terminals within the sinus node has also been suggested as a cause of bradycardia in such instances.

Ferrer suggests that sinus node dysfunction may become permanent as a consequence of myocardial infarction. The exact incidence of the fully manifest sick sinus syndrome, in the wake of a myocardial infarction and the time interval between the initial insult and the appearance of clinically recognizable sinus dysfunction are unknown.¹⁰

Of 56 patients who were studied at the Massachusetts General Hospital because of sick sinus syndrome, 20 had coronary artery disease⁸ and most of the group were elderly. The age of onset of symptoms in the study group suggested that the disease may have a bimodal distribution. The presenting signs or symptoms included syncope, lightheadedness, palpitations, congestive heart failure, angina pectoris, fatigue and cerebrovascular accidents. Many patients had associated electrocardiographic abnormalities such as first degree A-V block, bundle branch blocks and fascicular blocks.¹² The latter findings suggest¹³ the possibility that the syndrome may not represent an isolated process involving the sinus node but in fact may be a pan-conduction disorder involving the A-V node and infranodal conduction

S.C. 72 F EXTREME SINUS BRADY - CRBBB

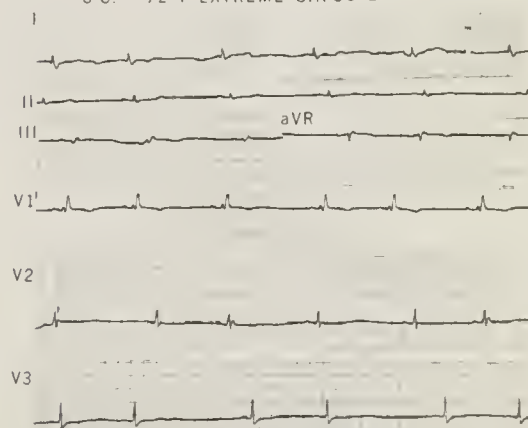


Figure 4

Electrocardiogram from a patient with symptomatic sinus bradyarrhythmia. The coexisting complete right bundle branch block indicates an association of sinus node dysfunction with disease in the distal conduction system.

systems as well, (Figure 4). Narula¹² and Rosen et al¹³ have reported a high incidence of A-V conduction abnormalities in their patients with sinus node

dysfunction. These findings have therapeutic implications with regard to the site of pacing, since atrial pacing would be of no value if heart block at these lower anatomic sites ensued.

Other clinical features¹⁴ include carotid sinus hypersensitivity, a blunted response to atropine administration and an exaggerated response to isoproterenol. The latter has been attributed to a possible denervation hypersensitivity characterized by lack of response to intrinsic but enhanced responsiveness to extrinsic catecholamines. A paradoxical response to atropine characterized by seemingly adequate increase in heart rate but an abnormally prolonged recovery time after overdrive suppression despite the apparent improvement in sinoatrial conduction time has also been noted.¹⁵

DIAGNOSIS AND ASSESSMENT OF SINUS NODE FUNCTION

Neurological etiologies must be excluded before sino-atrial dysfunction can be incriminated as the sole cause of lightheadedness or syncope in the elderly population, since both disorders may produce identical symptoms. When bradycardia or tachycardia is established as the basis for symptoms, drug induced causes for these rhythm disturbances must be considered before intrinsic disease of the sinus node is diagnosed.

Of methods available for the assessment of sinus node adequacy, isometric exercise, demonstration of carotid sinus hypersensitivity, and the cardiac response to atropine may be employed at the bedside. Definitive diagnosis, however, is based on invasive study utilizing atrial pacing. Since direct recording of sinus node potentials is not possible in man, all electrophysiologic methods for sinus node assessment are of necessity, indirect. Two methods are generally applied and they are: 1) the extrastimulus method, and 2) overdrive suppression with rapid atrial pacing. The extrastimulus technic is used as follows: the atrial electrogram initiates a programmable stimulator which delivers the extrastimulus at any desired coupling interval such that the entire diastolic period can be scanned.

Overdrive suppression is more reliable and gives reproducible and consistent results in the evaluation of sinus node dysfunction. Both methods are based on the principle which assumes that an extraneous atrial impulse may invade the sinus node, thereby resetting it or suppressing its function until it recovers. Such resetting effects the pause observed after a premature atrial beat. The time taken by the sinus node to recover after suppression by a focus discharging at a rate faster than itself is called the sinus recovery time and when corrected for the basic heart rate prior to suppression, yields consistent results, thereby providing a reliable

measure of sinus node function,¹⁶ (Figure 5).

At this point definition of a few terms frequently employed in the assessment of sinus node function is in order. *Basic cycle length* is the P-P interval during inherent sinus rhythm. During a pacemaker induced rhythm it is referred to as the *driven cycle length*.

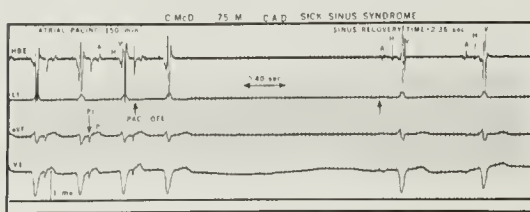


Figure 5

Simultaneously recorded His bundle electrogram (HBE) and leads I, aVF and V₁ of the electrocardiogram in a 75 year old man with coronary artery disease and the sick sinus syndrome. Cessation of atrial pacing (rate = 150/min) results in a 2.36 second pause followed by spontaneous sinus activity. The asystolic period was 295% of the basic cycle length, diagnostic of sinus node dysfunction (PI = pacemaker impulse).

The coupling interval between the sinus P wave and the introduced extrastimulus abbreviates what would have otherwise been a normal sinus cycle and is therefore termed *the curtailed cycle*. Frequently this is expressed as a percentage of the basic cycle length because the behaviour of the distal conduction system depends on the degree of prematurity of the extrastimulus. The curtailed cycle is better characterized when expressed in this fashion. The resumption of sinus activity after the extrastimulus has reset the sinus node defines *the return cycle*. *The conjoined cycle* is the sum of the *curtailed* and *return* cycles.

The sino-atrial conduction time is half the return cycle length assuming that no protective entrance block exists and that cephalad and caudad conduction times are equal. This assumption is arbitrary and therefore the sino-atrial conduction time can at best only be an approximation.

When a premature impulse or a series of extraneous impulses fail to penetrate the sinus node such that no suppression or resetting occurs, then *entrance block* is said to exist,¹⁷ (Figure 6). This is manifest during extrastimulus studies by the sinus node behaving as though the extrastimulus did not exist. In other words, the atrial extrasystole would appear to be truly interpolated.

Occasionally, the sinus node discharges much earlier than expected following an extrastimulus or a premature atrial beat¹⁸ thereby producing a conjoined cycle which is much shorter than the basic sinus cycle length. When such a phenomenon is operative, sinus node re-entry is said to have occurred. The unexpected early sinus beats can be single or repetitive with the latter effecting a sustained supraventricu-

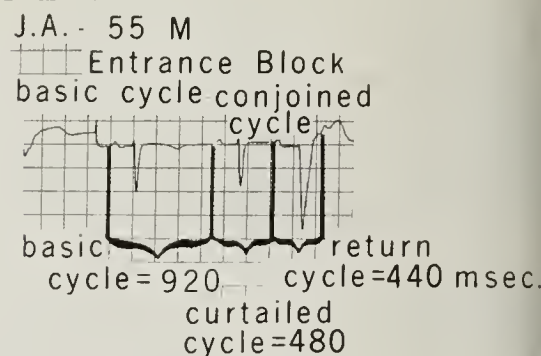


Figure 6

Lead V₁ of the electrocardiogram in a 55 year old man demonstrates S-A entrance block. Note the basic P-P cycle of 920 msec. An atrial premature beat with left bundle branch block aberration results in a *CURTAILED CYCLE* of 480 msec. The next P wave, resulting from sinus node activity, falls on the S-T segment of the atrial premature beat. The time from the onset of the premature P wave to this sinus P wave is termed the *RETURN CYCLE* and is 440 msec. Note that the *CURTAILED CYCLE* + *RETURN CYCLE* are called the *CONJOINED CYCLE*. The *BASIC CYCLE* in this case was identical to the *CONJOINED CYCLE* thereby indicating that the atrial premature impulse did not penetrate the sinus node (entrance block).

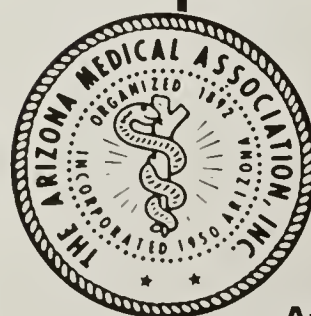
lar tachycardia. Whether or not sinus node re-entry is a mechanism for the episodes of supraventricular tachycardia observed in some cases of the "brady-tachy" syndrome remains to be elucidated.

Documentation of the exact mechanism producing syncope may be achieved in some cases of sick sinus syndrome by ambulatory Holter monitoring. This technic is the most valuable non-invasive means for confirming the diagnosis.

THERAPY

Ventricular pacing is the most effective method for the therapy of symptomatic bradycardia. The ventricular pacing site permits: 1) the use of cardiac glycosides if there is coexisting heart failure, 2) the use of various antiarrhythmic agents for abolition of tachyarrhythmias and 3) protection if coexisting junctional or His-Purkinje disease progresses and produces A-V block. Such ventricular pacing is far superior to atrial pacing or the long term administration of oral agents such as isoproterenol, which yield disappointing and unpredictable results.

Bibliography available upon request.



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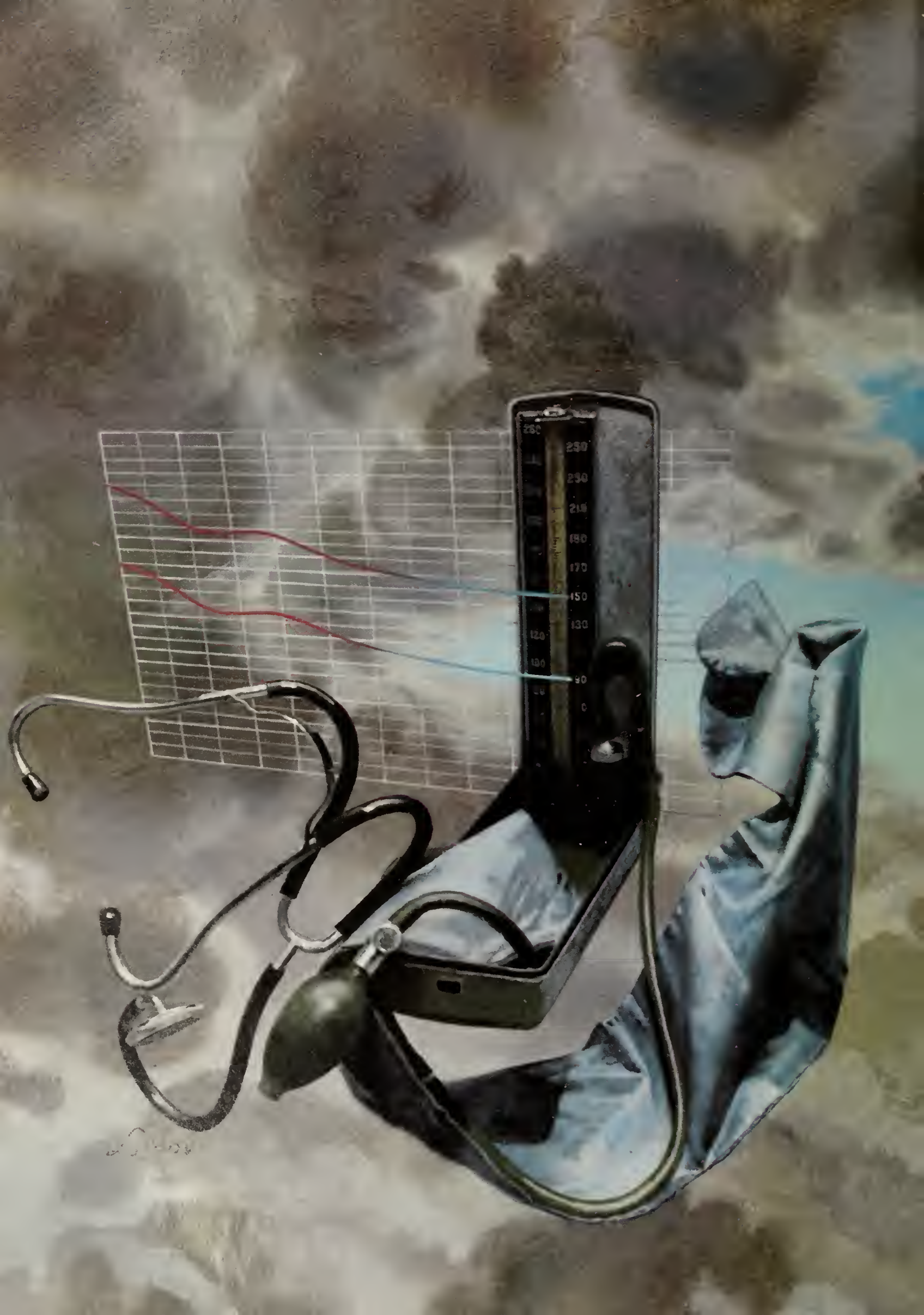
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age requires that potential benefits be weighed against possible hazards to the fetus. Zaroxolyn appears in the breast milk. Not for pediatric use. **Precautions:** Perform periodic examination of serum electrolytes, BUN, uric acid, and glucose. Observe patients for signs of fluid or electrolyte imbalance. These determinations are particularly important when there is excessive vomiting or diarrhea, or when parenteral fluids are administered. Patients treated with diuretics or corticosteroids are susceptible to potassium depletion. Caution should be observed when administering to patients with gout or hyperuricemia or those with severely impaired renal function. Hyperglycemia and glycosuria may occur in latent diabetes. Chloride deficit and hypochloremic alkalosis may occur. Orthostatic hypotension may occur. Dilutional hyponatremia may occur in edematous patients in hot weather. **Adverse Reactions:** Constipation, nausea, vomiting, anorexia, diarrhea, bloating, epigastric distress, intrahepatic cholestatic jaundice, hepatitis, syncope, dizziness, drowsiness, vertigo, headache, orthostatic hypotension, excessive volume depletion, hemoconcentration, venous thrombosis, palpitation, chest pain, leukopenia, urticaria, other skin rashes, dryness of mouth,

hypokalemia, hyponatremia, hypochloremia, hypochloremic alkalosis, hyperuricemia, hyperglycemia, glycosuria, raised BUN or creatinine, fatigue, muscle cramps or spasm, weakness, restlessness, chills, and acute gouty attacks. **Usual Initial Once-Daily Dosages:** mild to moderate essential hypertension—2½ to 5 mg; edema of cardiac failure—5 to 10 mg; edema of renal disease—5 to 20 mg. Dosage adjustment may be necessary during the course of therapy. **How Supplied:** Tablets, 2½, 5 and 10 mg.

References:

- 1 Dornfeld L, Kane R: Metolazone in essential hypertension. The long-term clinical efficacy of a new diuretic. *Curr Ther Res* 18: 527-533, 1975
- 2 Data on file, Medical Department, Pennwalt Prescription Products


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MAKES SENSE FOR LONG-TERM CONTROL OF HYPERTENSION*



Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* WARNING

This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with

cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K^+ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy. Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations, particularly important in patients vomiting excessively or receiving parenteral fluids. Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+ . Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium[®] (triamterene, SK&F Co.), and

leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

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TRIAMTERENE CONSERVES POTASSIUM WHILE HYDROCHLOROTHIAZIDE LOWERS BLOOD PRESSURE

PREVENTIVE MEDICINE AND THE PUBLIC HEALTH

Are we gaining or losing?

JOHN W. KENNEDY

"We have a cost explosion in health care delivery that will make this society bankrupt" this is the way Dr. Ernest L. Vinder, President of the American Health Foundation, commented. He continued, "About 8.3% of the Gross National Product goes for disease care and hardly anything goes for health care preventive medicine".

"To the average doctor preventive medicine is economically not rewarding". Medicare and Medicaid schedules and insurance plans reimburse us only for treatment of disease. So in our current system it is very difficult for the physician to do a lot of preventive medicine services because third party carriers would hardly ever pay for that. The insurance industry has no incentive to prevent illness. The solution is not just help, education. It is the implementation of that information". The American Health Foundation now has programs going rapidly into the factories doing screening for hypertension, cholesterol cervical and breast cancer. Smoking cessation programs are coming right into the places where people work.

The role of the physician is to work with allied health professionals, supervise them and see that the preventive programs are properly conducted and if any disease is found that it is channeled properly to the therapeutic establishment. Since it is

very difficult for the practicing physician to do a lot of preventive services perhaps we should recognize from the beginning that maybe we ought to train a whole group of other people who can do this type of preventive care better and more cost effectively. It is thus encouraging to see some organizations that are giving thought to preventive medicine, long after preventive medicine in relation to infectious diseases has gone out of style as part of a physician's practice. Vaccination for smallpox a long time stalwart in our preventive medicine program is now declared to no longer be needed. In fact you can scarcely buy the vaccine.

Some states are making real projects out of using public health preventive medicine in relation to present day medical problems. There are some programs under way which are used to attack the scourge of arteriosclerosis which arises in mid life. "The incubation period of arteriosclerosis is long, probably in the range of 40 to 50 years from inception in youths to its clinical manifestations in middle to old age. It claims approximately one million Americans each year and results in 50% of the deaths in the United States. 5% of the victims die when less than 60 years of age and many more are debilitated in the economic prime. It's financial toll is forty billion annually for the United States. The magnitude of this disease is so great

that it constitutes a public health problem".

In the state of Georgia, Project 66 has been developed to educate students in general, and individuals, of high risk (children of parents who had a myocardial infarction or stroke prior to the age of 50) to the risk factors and methods of possible prevention.

The three major risk factors are hypercholesterolemia, hypertension and smoking. The minor risk factors include obesity, sedentary living habits, psychosocial tension, glucose intolerance and genetic predisposition.

"Public education of our children appears to be the best chance for success with primary prevention of arteriosclerosis. If we can get to the children before their life nutritional, activity, and smoking patterns are established we have a better chance of changing these patterns. An additional reason to aim at education of children is the fact that the disease process has not become irreversible at that time. Fatty streaks of an adolescent's coronary arteries are probably reversible whereas the fibrous plaques of a 35 year old are probably irreversible regardless of the person's motivation to change his life style."

It is encouraging to see that this and other programs are popping up over the country, while their effects must be long range and sustained over many years, they are aimed at prevention of arteriosclerosis.

It may well turn out that the current fad for esoteric plants, transplants, bypasses and other attempts at repairing the damages after it is already done, it may well turn out that these are the most ill conceived, ill advised and expensive procedures of present day medicine.

Let us hope that preventive medicine can again become the thrust of modern medicine.



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COMMON MALIGNANT AND PREMALIGNANT TUMORS OF THE SKIN

PETER J. LYNCH, M.D.

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Nearly all of the most common skin tumors arise from the epidermal compartment of the skin. Tumors of the melanocytic series of cells (melanomas) have been previously covered in this *Clinical Oncology* series (June 1976). Thus, in this month's article, only atypical proliferation of keratinizing cells will be discussed. Knowledge of these lesions is of tremendous importance to all practicing physicians since skin cancer is the one form of malignancy which could be completely eradicated with early recognition and appropriate treatment.

Actinic Keratoses. Actinic keratoses arise as a direct result of chronic exposure to sunlight and, for this reason, they are seen only on the sun-exposed areas of the skin. In a manner analogous to "pack years" of cigarette smoking, it takes 20 or more years of cumulative sun exposure before damage becomes clinically apparent. Two other factors separate from but related to sun exposure are also important in the pathogenesis of these keratoses: the degree of cutaneous pigmentation and national background. Thus, actinic keratoses develop almost exclusively in individuals who are "fair skinned" with blue or hazel eyes. However, given individuals of equally fair skin, those of Celtic origin can be expected to develop a considerably greater degree of disability. This is probably because of their uneven melanocytic response to sun exposure (freckling) as opposed to the even tanning which occurs in other fair-skinned northern Europeans.

Actinic keratoses are scaling papules which arise against a background of mild chronic inflammation, irregular pigmentation, and (on the face at least) telangiectasia. The scale is white to slightly yellow in color and it is rather loosely adherent to the underlying tissue. The scale feels rough on palpation and small lesions may sometimes be more easily felt than seen. Actinic keratoses must be differentiated from other keratoses such as the entirely benign seborrheic keratoses which are more sharply margined, smoother to palpation, and browner in color.

Actinic keratoses should be treated when possible since they do have the potential for carcinomatous degeneration. When actinic keratoses are few in number, they are most easily destroyed with liquid nitrogen, trichloroacetic acid, or electro-surgery. Liquid nitrogen has the advantages of speed, safety, and freedom from scarring, but it is not always available and it is difficult to store. Trichloroacetic acid is also convenient, especially since it requires no special storage considerations. However, accidental spills (especially around the eyes) can be disastrous. Scarring may also occur. Electrosurgery is much more time consuming because of the requirement for injected local anesthesia and it is also more likely to result in scarring. Obviously, scalpel excision would also be effective, but this is really a much more vigorous approach than the severity of the disease requires.

When the number of actinic keratoses is great, the lesions are best treated with topically applied 5-fluorouracil. This is available in both cream and solution and in a variety of strengths. Generally, the lower concentrations (1% or 2%) are used on the face and bald areas of the scalp, whereas the 5% preparation is required for the arms and dorsal surfaces of the hands. Applications are carried out one or two times daily by the patient for a period of approximately 3 weeks. At that time, therapy is discontinued and the patient is reexamined for evidence of early carcinomas or individual keratoses which have failed to respond. Patients must be warned that beginning several days after the first application, severe inflammation, such as that which would be seen with a bad sunburn, will develop in the treated areas. It should be pointed out that this is an expected effect and the treatment should be continued unless the discomfort is unusually severe. Recent discussion in the medical literature suggests that a good result can be obtained even though the inflammatory response is suppressed. For this reason, some physicians use topical steroids concomitantly with the 5-

fluorouracil applications. Whether or not this approach will stand the test of time is not presently known.

Actinic Chelitis. Actinic chelitis is the mucosal equivalent of actinic keratosis occurring on the sun-exposed portion of the lower lip. The earliest changes are recognized by the subtle obliteration of the vermilion border, together with a gradual greying of lip color. Since the cells of the lip form little or no keratin, scale is absent but chapping may be extensive. Late actinic chelitis is recognized by the appearance of shallow, slowly healing erosions and finally by the development of palpable nodularity. This latter change generally signals the development of frank squamous cell carcinoma. Leukoplakia in the form of sharply margined soft white plaques may be superimposed on the actinic chelitis.

Since actinic chelitis, like actinic keratosis, eventuates in carcinoma, treatment is usually desirable. Any patient with eroded areas or elevated white plaque should have a shave biopsy performed. If no carcinoma is present in the biopsy specimen, the entire area of involvement can then be treated by electrosurgery or by lip shave with or without mucosal advancement. With the very early, non-eroded lesions, liquid nitrogen, 5-fluorouracil, or trichloroacetic acid may be all that is required. If carcinoma should be identified on biopsy, deep wedge excision is the treatment of choice.

Basal Cell Carcinoma. Basal cell carcinomas are also sunlight-induced lesions and they are generally found on the forehead, nose, cheeks, and ears of fair-skinned individuals. For unknown reasons, they are uncommonly seen on the equally sun-exposed areas of the arms and hands. The individual lesions appear flat-topped, sharply margined, skin-colored or translucent papules. Early lesions, usually less than 1 cm in diameter, show no central depression or necrosis—characteristic feature of more advanced lesions. They are asymptomatic but bleed and crust easily if traumatized. For this reason, any crusted lesion on the face which fails to heal over a period of several weeks should be biopsied. Clinical basal cell carcinomas may be confused with sebaceous gland hyperplasia and with nonpigmented dermal nevi. However, the soft consistency of the latter and the lobulated appearance and lack of growth of the former should allow for accurate distinction.

Because of their locally invasive growth, basal cell carcinomas require treatment even though the metastatic rate is so low as to be almost nonexistent. Prior to definitive treatment, a small fragment



CASE #19

PHILLIP H. STRATEMEIER, M.D.
PETER BRUMBAUGH

The tumor is removed for biopsy. Therefore, the entire lesion is treated with electro-surgery, excisional surgery, cryosurgery, or radiation therapy. Each of these approaches gives a cure rate approximating 100% and the method used depends on the physician's preference. Electro-surgery with curettage has the advantage of speed, low cost, and good to very good cosmetic appearance. The major disadvantage with this approach is the long (2-3 week) period of healing. Excisional surgery gives equally good cosmetic results and considerably quicker healing but requires more time to carry out and may be considerably more expensive. Radiation therapy gives excellent cosmetic results if treatment is fractionated, but this in turn requires multiple visits. Nevertheless, radiation therapy probably remains the treatment of choice for lesions on the eyelids and the nasal labial folds. Cryosurgery in which liquid nitrogen (monitored by thermocouples) is applied with a metal probe has recently become quite popular. Whether or not this approach will stand the test of time cannot be presently stated.

Special mention should be made of a particular surgical technique known somewhat inaccurately as Mohs' chemosurgery. This approach requires frozen section microscopic examination of each piece of tissue as it is removed from the area of the tumor. Step by step monitoring of the tissue removed allows for unexcelled tissue conservation coupled with extremely high cure rates. However, this approach is very time consuming and expensive. Generally its use is justified only for recurrent tumors or for extremely large primary lesions.

Squamous Cell Carcinoma. Three types of squamous cell carcinoma exist and they will be discussed separately. The most common of the three types is the "actinic" squamous cell carcinoma. This tumor arises in a preexisting actinic keratosis and is recognized clinically by the development of nodularity underneath an otherwise typical actinic keratosis. These actinic squamous cell carcinomas are low grade, well-differentiated tumors. They have an extremely low rate of metastasis—less than 2%—and may be quite satisfactorily treated with any of the modalities mentioned under basal cell carcinoma.

The second type, "nodular" squamous cell carcinoma, arises from normal skin or mucous membrane without the intervening appearance of an actinic keratosis. These lesions are less closely related to sunlight exposure and may be found on non-exposed areas of the skin. Generally they appear as a smooth, non-scaling nodule which somewhat resembles a basal cell carcinoma. However, they tend to be

more dome-shaped and central necrosis is rather regularly present. Metastatic rates for nodular squamous cell carcinoma vary from 5% to 10% for lesions on the face and lips to double that for lesions arising in old burn scars or on X-ray-damaged skin. A tumor known as a keratoacanthoma may have a rather similar appearance but for practical purposes, can and should be treated as if it were a carcinoma. Nodular squamous cell carcinoma should be removed by scalpel excision, as this allows for adequate histologic examination of the tumor margins. Electro-surgery and radiation therapy are also effective, but one does not have complete certainty that all of the tumor has been completely destroyed.

The least common type of squamous cell carcinoma is Bowen's disease or squamous cell carcinoma *in situ*. These lesions appear as flat-topped, erythematous plaques 2 to 8 cm in diameter. Growth occurs so slowly that patients will often claim that they have recognized no change for months or years. Thus, both the patient and the physician have a false sense of security and the lesions are often passed over as isolated plaques of psoriasis or eczema. Treatment for Bowen's disease is best carried out with electro-surgery and curettage. Radiation therapy and excisional surgery are effective but are less desirable because of the large surface area involved.

Prevention. The paragraphs above emphasize the recognition and therapy of already existing lesions. Articles such as this in the past have probably erred by overemphasizing treatment and underemphasizing prevention. Sunlight is, of course, a carcinogen that could theoretically be completely avoided. While this is not practical, sunlight exposure can at least be minimized. Sunbathing for no reason other than tanning ought to be completely proscribed for all individuals. Other outdoor activities can be carried out safely provided that light-skinned individuals utilize appropriate screening. This consists of clothing such as hats and long-sleeved shirts and the use of sun protective creams for those areas which cannot easily be covered with clothing. The newer sun protective creams containing para-aminobenzoic acid such as Presun® and Eclipse® are extremely effective and are quite cosmetically acceptable. Unfortunately, this message regarding sunlight protection seems to be reaching only individuals who have already developed sun-damaged skin. It is most pressing for all of us to now carry this message to young people if really meaningful preventive medicine is to be practiced.

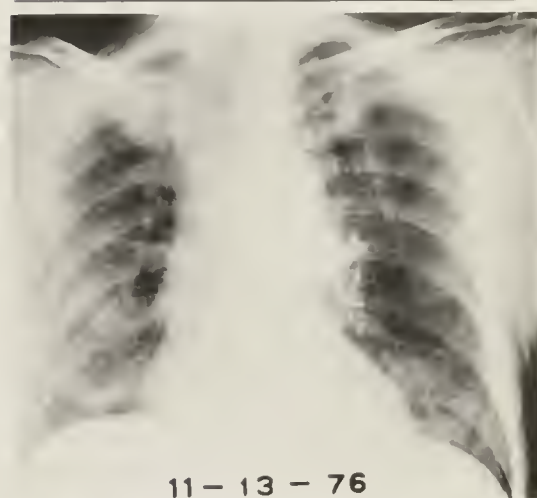


Figure 1

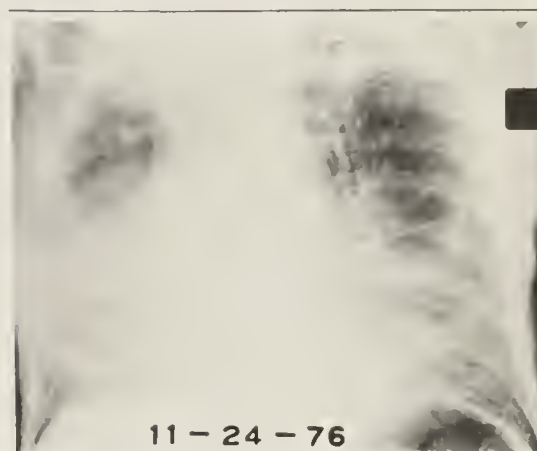


Figure 2

This was the final admission for a 75 year old male with chronic lymphocytic leukemia. Prior to his admission he developed mild dyspnea without cough or fever. A chest radiograph (Figure 1) was obtained. Despite therapy, his dyspnea became more severe and he developed a fever to 104°. The second chest radiograph (Figure 2) was then obtained and the patient subsequently expired. What are the diagnostic possibilities for the appearance of the chest radiographs?

From the Department of Diagnostic Radiology, University of Arizona Health Sciences Center, Tucson, Arizona 85721 (Dr. Stratemeyer). Senior Medical Student, U of A College of Medicine, Tucson, Az 85721 (Mr. Brumbaugh).

Diagnosis: *Pneumocystis Carinii*

In the first radiograph there is diffuse interstitial pulmonary disease with an alveolar component. At the time, it was believed that the appearance was due either to pulmonary edema from congestive heart failure or fluid overload, or to a bilateral pneumonia. However, the patient had no clinical evidence for CHF, and he was not receiving intravenous fluids. Although sputum cultures were negative, blood cultures grew *Klebsiella*, and therapy was instituted. After an initial limited response, his condition deteriorated and the second radiograph showed marked progression of the disease with a predominant alveolar component.

This case is presented because too often the diagnosis of opportunistic infection is made late in the patient's illness. When diffuse lung disease occurs in patients with chronic illness and/or with a compromised immune response, the following differential possibilities must be considered:

1. the disease process itself
2. therapeutic measures (drug reactions)
3. opportunistic infection
4. transfusion reaction
5. some other cause, not necessarily related

The failure of the patient to respond to therapy should have alerted the clinicians to one of the above differential possibilities. Leukemic infiltrates do occur, but rarely, if ever, present as diffuse alveolar infiltrates. Patients with leukemia are often treated with multiple drug regimens which themselves may cause pulmonary edema. However, this patient was receiving only prednisone at the time of his last admission. There were no transfusions which could have caused a reaction, or provided sufficient white cells in a leukopenic state to react with an unrecognized pneumonia. Finally, other conditions that might have caused diffuse pulmonary edema such as pulmonary hemorrhage, adult respiratory distress syndrome, or shock lung, were excluded clinically.

The most likely diagnosis is an opportunistic infection. In this geographic region, *Coccidioidomycosis immitis* is a prime consideration. However, opportunistic *Cocci* usually presents in the lung as multiple interstitial nodules. Although *Nocardia* is also a possibility, particularly in a patient on steroids, it is usually a localized infiltrate which can frequently cavitate. Other opportunists can similarly be excluded by the radiographic appearance, with the exception of viral organisms and *Pneumocystis carinii*. Treatment

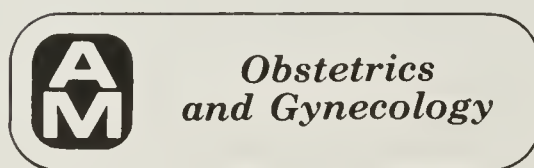
for a viral disease is supportive measure to which he was not responding.

Pneumocystis carinii is an opportunistic infection which occurs almost exclusively in an immune compromised host. The organism has not been cultured and has morphologic characteristics of both: protozoa and a fungus. It is thought to be transmitted by inhalation, possibly from asymptomatic carriers. Diagnosis is made by open lung biopsy. The disease is most frequently found in infants and children but can be found in adults that are immune suppressed as in this case. When it is suspected, it is important to alert the clinicians in order to institute therapy promptly. Untreated, the disease is associated with a 40-50% mortality.

Radiographically it begins as a diffuse interstitial disease, often reticulo-nodular. It progresses to an air space filling process with air bronchograms. It is frequently perihilar resembling pulmonary edema with renal failure or heroin overdose. There is no associated pleural effusion or hilar adenopathy.

In patients with diffuse lung disease who have a suppressed immune mechanism, the possibility of an opportunistic infection should always be considered in order to initiate appropriate therapy in time.

Bibliography available upon request.



USE OF CORTICOSTEROIDS IN PREMATURE LABOR

PART II

JOHN KELLY, M.D.

This month we conclude the discussion on the administration of corticosteroids to mothers in premature labor to stimulate production of surfactant by the fetal lung.

DONALD J. ZIEHM, M.D., Editor

The use of corticosteroids has definite advantages, but what are the risks involved? These drugs have been studied in a number of animal species, showing that there may be a decrease in the total number of lung and brain cells in offspring of animals treated with steroids. Does this mean that, even though the drug is being used to prevent death from Respiratory Distress Syndrome (RDS), other effects may be produced that may adversely influence lung growth, capacity, and compliance? What happens within the brain? Will the treated children demonstrate a significant change in motor activity and intelligence from their non-treated siblings?

All of the animal studies have used dosages of steroids many times higher than that used in humans—an important consideration. With comparable dosage there has been no demonstration of deleterious effects, regardless of the species. However, one need only recall the Thalidomide tragedy. Researchers have done many studies in small animal species proving that Thalidomide had no adverse effect; so it was released. Suddenly babies were delivered with no limbs. Virtually unnoticed was Russian work using Baboons in which phocomelia was produced. The Baboon is the primate which is most similar to humans with regard to the placenta and uterine circulation.

in. So at the present time glucocorticoids are being studied in Baboons. As yet no apparent disadvantages to using the drug have been found.

But the concern with use of steroids is not only related to their effects on the fetus. What about the fact that steroids can increase the risk of infections because of their reduction of the immune response? Does this contraindicate its use in the mother with premature rupture of membranes? If she is given steroids will this make her more liable to infection? The answer apparently is no, at least in a large number of patients studied by Liggins. However, there is a consideration many people aren't aware of—the custom in New Zealand is to start women with premature rupture of membranes on ampicillin. So all the patients in Liggins' study showing no infection had been treated prophylactically with Ampicillin. Other series not using prophylactic antibiotics have also found no increase in infection, although they were not as intensive as Liggins' studies, with over 1000 patients.

Liggins in his initial work found that, when steroids were given to patients who were hypertensive with evidence of placental deterioration (demonstrated by a drop in estriol), there was a significant increase in stillborn infants in those patients treated with steroids compared to the non-treated group. From 1969 to 1974 there was a 25% incidence of stillbirths in steroid patients, while the rate was only 7% in non-treated women. Autopsies showed no apparent cause for the deaths. The presumption was that these were seriously ill patients with more than 50% reduction in estriol production and therefore the babies were moribund anyway. So he recommended that steroids not be used for women in premature labor if they were toxemic.

After 1974 however, only a 2% incidence of stillbirths occurred in 59 patients with toxemia and prematurity, despite continued use of steroids. Liggins is now of the opinion that steroids can be used in these toxemic patients who have placental deterioration, without a fear of stillbirths. In another recent study by Storker from the Royal Victoria Hospital in Montreal, giving steroids in all patients in premature labor (including the hypertensive patients) no increase in stillbirths was found, but the danger to this group is not yet clear.

What are the long term effects on the infants and children? Liggins has been studying children since 1969 with a followup of 100 children whose mothers were treated with steroids during pregnancy. He has found that through the age of 5 years both groups (treated and non-treated) were comparable with respect to physical growth and health. The coordination and motor abilities of both groups were equal, the IQ as evaluated by the

Stanford-Binet test was equal (100.8 vs 98.9), and the personality inventories of the treated children were either normal or similar to the control group. So, at least at the age of 5 years, there have been no detectable long-range effects. These include gross evaluation of lung function in these children. Further studies are being continued in this group of cohort children.

The dosages used by most people are based on Liggins' original work using 6 mg of Betamethasone phosphate in 2 different salts for a total of 12 mg IM daily for 2 doses to the mothers. Betamethasone and dexamethasone are very similar. This dosage has several effects in the fetus. It increases the level of synthetic steroid. Since this is not a natural steroid, a "foreign substance" is present in the fetus. The levels achieved are about equal to the level of cortisol which would be produced when a baby is under stress—stress from infection or from RDS. It's not a tremendously high level, but one that the distressed fetus would have generated with its own endogenous production. Keep in mind, however, that steroid administration interferes with estriol production since it suppresses adrenal function by means of suppressing ACTH in the fetus. Estriol levels will decrease and remain low for about 2 days and then rebound. At that time the fetus will have an endogenous rise in cortisol (Ballard). Therefore corticosteroids will also reduce the endogenous production of cortisol. This particular dosage will persist for 3 - 4 days in the fetus. Because of the above factors it is reasonable to suspect that lower dosages can be used. It should also be pointed out that, despite giving steroids to some women, babies still develop RDS. So in one group Liggins doubled the dosage—instead of giving 12 mg once a day for 2 days he gave 24 mg daily for 2 days and found no improvement. So even though much more cortisone is given it doesn't improve the situation for the baby. But less can be given. At the present time, in order to reduce the duration of synthetic steroid levels in the fetus, he is using a dose of 5 mg every 12 hours for 2 days.

If fetal adrenal function is suppressed the precursors of the estrogens are reduced. Estrogens are important for the maintenance of vasodilation in the uterus and for good uterine blood flow. Thus it is possible that giving cortisone could decrease the uterine blood flow. For this reason some workers are giving DHEA, theorizing that the administration of precursors with the steroids could result in production of estrogen to prevent a significant reduction in uterine blood flow. That is entirely theoretical and unproven at this time.

New possibilities in the management of premature labor to prevent RDS:

1. Use of a natural glucocorticoid, in contrast to a synthetic one, to avoid any "foreign" materials. It would be optimal if the pharmacologists could find a

steroid that has a specific effect only on the pulmonary cells and not on the brain, liver, thymus or any other area of the body.

2. It might be reasonable to give ACTH to the mother. Although ACTH will not cross the placenta because of its molecular size, it may stimulate increased maternal cortisol release. The maternal cortisol could then traverse the placenta and serve as a stimulus to surfactant production and release in the fetus.

3. Low levels of thyroxine have been demonstrated in cord bloods of babies with RDS. It has also been found that thyroxine can be given to mothers with premature babies with a resultant increase in the L:S ratio. So possibly thyroxine has some effect on the synthesis and release of surfactant. This has been demonstrated in animals. Maybe that will have less potentially dangerous side effects than the corticosteroids. Aminophylline is another drug which has been shown in animals to produce surfactant.

4. A new approach is to use steroids electively in selective patients. In a patient who has had 2 or 3 consecutive pregnancies with premature labor, often by the time she comes in it may be too late to give the steroid. Some people are now advocating the elective use of this drug starting at 28 weeks or so in these patients who are unpredictable and may deliver prematurely. The same approach applies to patients who have multiple pregnancies where premature labor is a factor. When the steroids are given, and surfactant is produced or released, that effect lasts only 1 week. The dosage must be repeated at the end of 1 week. If the baby is born after 1 week, but before its own systems take over at about 35 weeks, the baby could still develop RDS.

SUMMARY

1. Glucocorticoids definitely prevent RDS and reduce the possibility of death in premature babies less than 35 weeks.

2. The short term safety has now been well established. The long range effects are not so clear.

3. Patients who already have an amnionitis are definitely not candidates for steroid use. It would be imprudent to administer corticosteroids to these patients.

4. Steroids are indicated in patients with premature labor or premature rupture of membranes prior to 35 weeks. It is true that they may not be as effective at 27 - 28 weeks as at 30 - 32 weeks, but we are obligated to administer them in these patients.

5. The present regimen is dexamethasone 8 mg twice daily for 2 days. Other programs are now being established to find a more appropriate dosage regimen.

6. In the future there may be alternative drugs—theophylline, aminophylline, thyroxine.



ANTIBIOTIC CHEMOPROPHYLAXIS IN CHRONIC OBSTRUCTIVE LUNG DISEASE

RICHARD B. MORGAN, M.D.

FAYSAL M. HASAN, M.D.

This continuing series of articles entitled "Seminars in Chest Medicine" will attempt to keep the reader abreast of developments in the broad field of pulmonary diseases. The format used will be that of brief succinct reviews written by the editors as well as guest contributors. Areas of controversy as well as practical chest medicine will be explored. We hope that these reviews will be of value in promoting continuing education for certification examinations as well as a forum for new and controversial issues. The editors welcome comments and discussion from our readers.

ROBERT J. CLARK, M.D.
LYNN M. TAUSSIG, M.D.
WILLIAM C. WEESE, M.D.

INTRODUCTION

Infections of the bronchial tree and lung parenchyma can produce at least transient physiological deterioration of lung function¹ and play a major role in prolonged morbidity and even death in patients with this disease.² This has led to the widespread prophylactic use of antibiotics in the management of chronic obstructive pulmonary disease.³ It is the purpose of this paper to review the rationale for antibiotic chemoprophylaxis and assess its efficacy in: (a) reducing the frequency and severity of acute bronchitic exacerbations and (b) preventing the accelerated progress of physiological impairment in obstructive airways disease. Chemoprophylaxis is here defined as the continuous or predetermined scheduled administration of antibiotics and does not include the routine use of various antibiotic regimens at the onset of increased respiratory symptoms.

Rationale for Chemoprophylaxis

There are several factors which may play a role in successful chemoprophylaxis of infectious disease. In the initial asymptomatic stages of infection, the total number of microorganisms is relatively small, and the proliferation of the infectious agent is rapid, making it especially susceptible to antibiotics. In addition, in early infection the development of "protected sites of anatomic localization" (i.e., abscess formation) has not yet occurred. Antibiotic chemoprophylaxis, however, has potential risks. While a short course of one antibiotic in low dosage is probably safe, longer courses and multiple drug regimens may result in superimposed infections due to the overgrowth of resistant microorganisms. Also, one risks a higher incidence of toxic and/or allergic drug reactions and increased costs of health care. Another possible disadvantage of antibiotic chemoprophylaxis is that it may give an unwarranted sense of security to the prescribing physician.

In theory, the rationale for chemoprophylaxis, as defined above, is that if an antibiotic can cure an infection, then it should prevent overt disease if given at or shortly after exposure to the infectious agent. It follows that the key to successful chemoprophylaxis of infection is the use of a specific drug directed against a specific infectious agent. Such therapy has been useful in several clinical conditions, including rheumatic fever, meningococcal infection, gonorrhea, syphilis, and tuberculosis.⁴ In contrast to these illnesses, chronic obstructive pulmonary disease is a noninfectious process with recurrent infectious episodes in which the pathogenic agent is often difficult to identify. For example, in 45 of 64 such cases there was no demonstrable change in the bacterial flora of sputum when compared with pre-exacerbation cultures.⁵ While a specific cause of the acute episode is often unclear, several infectious agents have been incriminated. Of these, *Hemophilus influenzae* and the pneumococcus are the species most commonly cultured from mucopurulent sputum during acute bronchitic exacerbations.^{6,7} Other microorgan-

isms cultured include *Staphylococcus aureus*, *Klebsiella* species, various anaerobes and many viruses. Thus, in chronic obstructive pulmonary disease antibiotic chemoprophylaxis is based on assumptions about the microorganism(s) most likely to be encountered.

Results

There have been several reported clinical trials of antibiotic chemoprophylaxis in chronic bronchitis and emphysema. The methodologies used, parameters followed and results obtained vary considerably, but provide useful information (Table I). Murdoch and Associates,⁸ in a double-blind study over two winters showed that fewer patients on continuous antibiotic therapy missed work due to bronchitis when compared to a placebo group. Their data were subsequently confirmed in separate 5-year winter studies by Calder and Associates⁶ and Johnston and Associates.⁹ In the latter study antibiotic prophylaxis was effective only in patients suffering from more than one exacerbation each winter. Pines¹⁰ also found antibiotic therapy to be superior to placebo in preventing purulent exacerbations of chronic bronchitis. On the other hand, Fletcher and Associates¹¹ could not demonstrate that antibiotic prophylaxis was better than placebo in reducing the incidence of acute bronchitic exacerbations.

There are little data in the English literature that demonstrate a favorable effect of antibiotic chemoprophylaxis on pulmonary function in chronic bronchitis and emphysema. Johnston and Associates showed a smaller average yearly decline in vital capacity and FEV₁ in antibiotic-treated patients compared to those treated with placebo. The results, however, were not statistically significant. It may be that much longer periods of study and follow-up and more sensitive measurements of pulmonary function will be needed for a satisfactory answer to this important question.

Choice of Antibiotic

The choice of antibiotic in chemoprophylaxis of chronic obstructive pulmonary disease may be a potential factor in the

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Table 1

Summary of Major Clinical Trials of Antibiotic Chemoprophylaxis in Chronic Obstructive Pulmonary Disease

Author	Year	Country	No. Subjects
Walden ⁶	1968	U.K.	27
Davis ⁵	1961	U.S.A.	29
Davis ¹²	1965	U.S.A.	40
Wletcher ¹¹	1966	U.K.	373
Francis ¹³	1961	U.K.	519
Johnston ⁹	1969	U.K.	79
Murdoch ⁸	1959	U.K.	98
Lines ¹⁰	1973	U.K.	58

ultimate efficacy of such therapy. (Table 1). Davis and Associates^{5, 12} showed little difference between intermittent tetracycline and daily chloramphenicol, and Hahn and Colleagues⁷ noted a similar lack of difference when comparing tetracycline and ampicillin. Francis and Associates¹³ demonstrated the superiority of tetracycline to penicillin but later¹⁴ showed only that sulfa, alone, was inferior to several other equally effective antibiotic regimens (tetracycline, penicillin, erythromycin and erythromycin plus sulfa). Although an increased incidence of isolating staphylococcal species and gram-negative rods from the sputa of antibiotic-treated patients has been reported, this has

At present there is no evidence that antibiotic chemoprophylaxis prevents or decreases the progression of physiologic impairment. The major effect of prophylactic antibiotic regimens in chronic obstructive pulmonary disease may be in assuring prompt treatment of acute infectious episodes rather than in preventing the insult leading to ultimate bacterial invasion of chronically inflamed bronchi.

In conclusion, we recommend that patients with chronic bronchitis and emphysema should be educated concerning the initial symptoms of the acute exacerbation and instructed to begin

Antibiotic(s) Used	Effect on Parameters*		
	A	B	C
Oxytetracycline	+	NA	—
Tetracycline	+	—	—
Chloramphenicol	+	—	—
Oxytetracycline	—	+	—
Tetracycline, Penicillin	+	+	NA
Tetracycline	+	NA	+
Tetracycline	+	+	NA
Trimethoprim-Sulfamethoxazole	+	NA	NA

*Effect of antibiotic chemoprophylaxis on various parameters: A. Number of acute exacerbations. B. Severity and/or duration of acute exacerbations. C. Physiologic measurements.

(+) = favorable response, (—) = no response, (NA) = Not Assessed.

Bibliography available upon request.

rarely been shown to be of clinical significance.^{8, 12}

Summary and Recommendations

Antibiotic chemoprophylaxis in chronic obstructive pulmonary disease seems to be beneficial in decreasing the duration and perhaps the severity of bronchitic exacerbations. The effect with regard to the number of episodes seems to be less clear. However, patients with more frequent exacerbations may benefit the most.

immediately a course of a broad spectrum antibiotic (i.e., tetracycline, ampicillin) at the onset of each episode. Long-term prophylactic antibiotic therapy should be reserved for those patients with repeated, frequent exacerbations, those who lose much time from work, and those who require prolonged hospitalizations in spite of using antibiotics during the acute exacerbations. Whether such prophylaxis is seasonal or year-round, daily or intermittent, is a decision that should be made in each individual case.

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Address all correspondence to the
Journal Offices
810 W Bethany Home Rd
Phoenix, Arizona 85013

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State Medical Journal
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2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

3. Although the Editors try to catch inaccuracies, the ultimate responsibility is the author's.

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7. Effective January 1977 Bibliographies will not be published, but available upon request.





MANAGEMENT OF THE PREGNANT DIABETIC AND HYPERTHYROID PATIENT

MARSHALL B. BLOCK, M.D.

Continuing with the present issue of *Arizona Medicine* is the series of articles entitled "Seminars in Endocrinology and Metabolism." The purpose of these short review articles is twofold. First, due to the rapid proliferation of new knowledge in the field of endocrinology and the multiple tests available for their evaluation, short, clinically oriented reviews would enable the physician to keep abreast of these newer developments as they relate to their practice. In addition, with great stress being placed on voluntary recertification in many subspecialties, reviews such as they could serve as an authoritative, succinct teaching forum. The editors will endeavor to accomplish these goals by utilizing the talents of practicing physicians as guest contributors to this series. Feedback, both positive and negative, is encouraged in order to help us fulfill these objectives.

THE PREGNANT DIABETIC

The most common pre-existing endocrine disorder requiring a change in therapy during pregnancy is diabetes mellitus. Most such patients require increased doses of insulin as gestation advances. *There are several factors which are responsible for this phenomenon. The placenta is a major factor in insulin degradation as it contains insulin-destroying enzymes (insulinases), which increase in activity as the placenta increases in size. Additionally, decreased sensitivity to insulin occurs as pregnancy progresses. This probably reflects alterations in the production of estrogen, progesterone and adrenal steroids. Furthermore, increasing caloric requirements of mother and fetus add to the already overburdened carbohydrate homeostatic mechanisms.* These factors then, are responsible for the two daily doses of both regular and/or intermediate acting insulin preparations which many juvenile onset diabetic patients require in the latter half of pregnancy.

The goal in diabetic gestations, as it is in the general diabetic population, is to maintain as euglycemic a state as is possible. There is a much higher fetal

morbidity and mortality if blood sugar regulation is not tightly controlled. Obviously, there are other factors which influence the success of the gestation, but good blood sugar control seems to correlate highly in this regard. As regards managing the pregnant diabetic patient, it should be borne in mind that in the latter half of pregnancy there appears, in addition to sugar, other urinary-reducing substances. It is, therefore, difficult to monitor control with sugar measurements of the urine alone and frequent blood sugar determinations are usually necessary. The prevalence of proteinuria and hypertension in pregnant diabetic patients is probably greater than in a nondiabetic pregnant population. Although pre-eclampsia and/or eclampsia can be partly responsible for these changes many diabetic patients have underlying renal disease which is not clinically or chemically apparent. Due to the stresses of pregnancy, they become unveiled. The occurrence of a nephrotic syndrome may be the first indication of such underlying renal disease and it should be closely monitored. The best time for delivery of diabetic patients is undergoing review at present. However, diabetic patients who are brought in electively for either cesarean section or elective induction should be treated with Regular insulin the day of delivery in order to avoid hypoglycemia following removal of the placenta, as insulin's half life is then prolonged.

As a sidelight, normal pregnancy can be associated with the development of fasting hypoglycemia if starvation or malnutrition occurs. This phenomenon has recently been studied and is thought to be partly due to decreased delivery of amino acid precursors to the liver for the production of glucose. The fetus appears to siphon these essential amino acids from the mother resulting in a decreased ability to maintain a euglycemic level during the fasting state. In contrast, the development of carbohydrate intolerance during pregnancy is understandable in light of the above noted hormonal and placental changes. Many of the patients who develop diabetic-type curves during pregnancy show no evidence of diabetes mel-

litus following delivery. However, later in life, a small percentage do develop more marked abnormalities which require long-term therapy.

The findings of large and heavy babies born to mothers with carbohydrate intolerance probably reflects the fact that there is continued hyperglycemia in the fetus which results in hyperinsulinism. Increased fat deposition and decreased lipolysis are the consequences, resulting in high weight for age infants.

PREGNANCY IN HYPERTHYROIDISM

Another endocrine condition which can occur in pregnancy and requires a change in our usual therapeutic approach is hyperthyroidism. Pregnancy can be a stressful state and may precipitate the development of Graves' disease. Various stresses may be associated with the appearance of hyperthyroid symptoms, although it is not known whether the emotional upheaval is etiologically responsible for the condition or is a factor in unmasking it.

Hyperthyroidism in pregnancy is somewhat more difficult to evaluate. The pregnant state produces changes in body metabolism which mimic to some extent those of hyperthyroidism. Skin texture changes result in smooth, soft and warm skin. There is usually a slight enlargement of the thyroid gland in pregnancy, which can be confused with the diffuse goiter of Graves' disease. Although weight loss is a cardinal feature of untreated hyperthyroidism, the pregnant state may hide this finding. Thus, it is sometimes clinically difficult to separate normal gestation from that associated with mild hyperthyroidism. Biochemical studies of the blood usually furnish the findings which make the diagnosis. However, increased production of thyroid binding globulin, under the stimulation of estrogen, can result in artificially elevated levels of total thyroxine, while the free component is normal. It is therefore essential to get not only a total thyroxine determination but a measure of thyroid binding globulin as well. Thus a "T-3 resin uptake" is a mandatory co-value which should be interpreted together with the total thyroxine determination. Another pitfall in diagnosing the condition by laboratory studies is the fact that there may be a molar pregnancy present resulting in the production of placental-type thyroid stimulating hormone which can result in an enlarged thyroid gland and a hyperthyroid state. In that situation, removal of the mole rather than the thyroid gland is in order for this produces regression of the underlying thyroid condition, (see *Seminars in Endocrinology and Metabolism, Arizona Medicine*, November, 1976).

Most thyroidologists would favor continued use of oral antithyroid drugs throughout pregnancy keeping blood thyroid hormone levels slightly above normal. The latter approach is to avoid the transplacental passage of these antithyroid drugs to the fetal thyroid gland and avoid fetal hypothyroidism. It has been suggested that Tapazole be used in pregnant hyperthyroid patients rather

than Propylthiouracil (PTU). This approach is based on the finding that thyroid hormone is produced not only in the thyroid gland but also by the peripheral de-iodination of T-4 to T-3. Since PTU but not Tapazole blocks this peripheral conversion in addition to its effect directly on the thyroid gland, it would possibly seem advisable to use Tapazole and avoid inhibition of fetal T-3 generation.

SUMMARY

Pregnancy produces changes in hormonal homeostasis which affects the diagnosis and management of diabetes mellitus and hyperthyroidism. Recognition of these changes will promote a better maternal and fetal outcome.



A COORDINATED REGIONAL PROGRAM OF RENAL REPLACEMENT THERAPY IN SOUTHERN ARIZONA

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Chronic hemodialysis and renal transplantation evolved during the 1960's from experimental therapies to effective and accepted means of extending useful life in terminal renal failure. The programs of the 1960's were primarily procedure oriented, according to the principal interests of the motivating physician group. These procedure oriented programs defined the problems with and expectations of chronic hemodialysis and renal transplantation.^{1,2} There has, however, been little significant improvement in patient survival since 1970.

The advent of the University of Arizona College of Medicine and its affiliated hospitals, and the lack, in 1969, of any artificial kidney or transplantation in any area hospital, afforded us the opportunity to evolve and develop a new concept in the treatment of end-stage renal failure. This concept embodied our conviction that people with end-stage renal disease require a program of renal replacement therapy that is patient oriented. The primary goal of such a patient oriented program should be the greatest possible

extension of additional life worthwhile to the patient. The program must be made available to all those with terminal renal failure in the region served who could expect to achieve worthwhile extension of life, and must encourage access to the program. It must make freely available all types of renal replacement therapy, and provide that type of therapy most likely to accomplish the greatest extension of worthwhile life for each individual patient. It must provide education of the patient concerning available types of renal replacement therapy, encourage an educated choice of therapy, and permit free movement from one type of therapy to another as required by the patient's needs and wishes. It must take cognizance of limited and costly resources by coordinating and integrating facilities to avoid unnecessary duplication of space, equipment and personnel. It must create a data system which permits analysis of results of the program and of its component parts such that the analysis can be utilized to improve any particular part of and therefore the total program. Success of the program should be quantitatively assessed in terms of patient survival.

This analysis reports results of the initial seven years of our program of renal replacement therapy.

METHODS

The program goals, initially vague, were subsequently defined essentially as stated in the introduction, in a series of meetings between the nephrologist and the transplant surgeon, and were submitted to the local Health Planning Council and to Tucson hospital administrators in

June of 1971 in a document entitled "A Program in Renal Diseases for Southern Arizona". The program was initiated at the Tucson Veterans Administration Hospital and was necessarily initially limited to veteran patients. Non-veteran patients were referred to Phoenix for hemodialysis, and to functioning transplant centers for transplantation. The University Hospital opened in September 1971, making possible extension of the program to all area residents by early 1972. This event is apparent in the number of patients entering the program reported in the results section.

A sharing contract concluded between the University of Arizona and the Veterans Administration in early 1973 permitted all transplant activities (including transplantation, organ procurement and perfusion, and tissue typing), and all home hemodialysis training to be accomplished at the Veterans Administration Hospital for both veteran and non-veteran patients. Special, separately staffed facilities for each of these activities were then constructed at the Veterans Administration Hospital and have accomplished these functions since

All patients potentially requiring renal replacement therapy were evaluated by his or her primary care group, by a medical social worker, and by a medical-surgical team consisting of all area physicians interested in dialysis and transplantation. Criteria for acceptance for renal replacement therapy have always been liberal, but became increasingly liberal as funds for such care became increasingly available. At the present time, all patients are accepted who grant informed consent for

From the Departments of Medicine and Surgery, The University of Arizona Health Sciences Center, and The Veterans Administration Hospital, Tucson, Arizona.

treatment; who are able to cooperate with treatment; and who feel, with their own physician's concurrence, that they will derive an extension of life worthwhile to them.

Treatment costs for veteran patients, both service connected and non-service connected, are met entirely by the Veterans Administration. Treatment costs for non-veteran patients were initially, partially and inadequately, met by the patients' own resources and health insurance. In 1972, the Arizona legislature passed HB 2041, providing a modest amount of state support for patients requiring dialysis or transplantation. In November, 1972, Public Law 92-603, Section 299I made more than 90% of U.S. Citizens with end stage renal disease eligible for Medicare payment of most in-patient costs and 80% of out-patient costs effective July 1, 1973. The availability of funds for care affected both the acceptance criteria as mentioned above, and the number of program entrants as detailed in the results.

The geographic area served by our program corresponds to the New Mexico border to the east, the border with Mexico to the south, and the border of California to the west. The northern border fuses gradually with the area served by Phoenix. Nothing, of course, precludes a patient from seeking care at any facility of his or her choice, and Medicare regulations specify that a patient must have freedom to seek care where he or she may wish. Convenience to the patient, proximity to the patient's home, classical referral patterns, and program space limitations in each major metropolitan area generally determine where the patient will be treated. The estimated population of this service area is 500,000. Since, however, the Tucson Veterans Administration Hospital provides most renal replacement therapy for veteran patients in Arizona, the population base may be somewhat greater than 500,000. Our geographic proximity to Mexico, and the total absence of any facilities to treat end stage renal disease in northern Mexico, has resulted in the referral or self-referral of a number of patients with terminal renal disease to Tucson area hospitals.

All patients undergoing at least a month of dialysis in any Tucson area chronic dialysis facility or at home, while supported by our home support facilities, and all patients receiving a transplant in our program are considered program entrants. Patient survival accrued prior to entry to our program as defined above is not included in our patient survival tabulations. Patients transplanted elsewhere and subsequently moving to and managed in this area are not included as program entrants. All dialysis patients are managed by an area nephrologist of their choice. Transplant patients are managed by faculty and staff transplant surgeons

and nephrologists during their transplant hospitalization, and subsequently by the physician of their choice. Cumulative survival rates have been calculated by the standard method of Merrell and Shulman.³

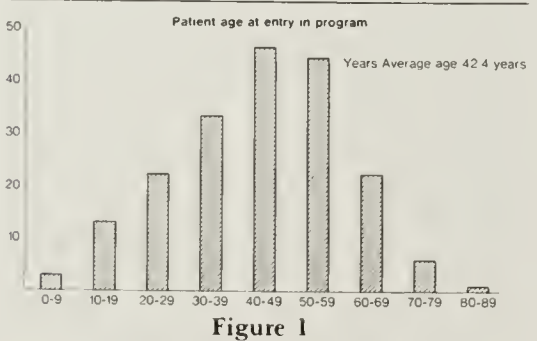
Table I			
Entrants by Calendar Year			
Year	No.	Cumulative No.	Average Age
1969	1	1	41.2
1970	7	8	
1971	5	13	
1972	25	38	
1973	30	68	41.4
1974	34	102	39.6
1975	42	144	42.4
1976*	46*	190	46.3

*Through 9/30/76 (9 Months)

RESULTS

General:

Table I shows the entry rate in our program by calendar year for the last quarter of 1969, 1970 through 1975, and the first 3 quarters of 1976, and also indicates the average age of patients at entry by calendar year except that entrants for the last quarter of 1969, and 1970 through 1972 were averaged together to provide approximately equal groups. There was little difference in average age through 1974. The advent of Medicare funding, provided by law starting in July 1973 but not in fact until April of 1974, resulted in expansion of facilities and a dramatic increase in the number of entrants and in the average age of entrants in 1975 and 1976. The age distribution of entrants is detailed in Figure 1.



Age distribution of program entrants by decades.

A total of 190 patients have been afforded renal replacement therapy since the program was initiated in October of 1969. Of these, 137 remain in the program either on dialysis or with a functioning transplant. Thirty-two patients have expired, 17 have transferred to other facilities out of our geographic area; two voluntarily withdrew from therapy; and 2 recovered sufficient renal function to survive without renal replacement therapy. Of the 190 program entrants, 69 or 36.3% were designated as high risk patients at the time of entry. Forty-two of these 69

were age 55 or older, 18 had diabetes mellitus, and 9 had other life limiting systemic diseases including 2 with multiple myeloma, 2 with secondary amyloidosis, and 1 each with systemic lupus erythematosus, polyarteritis, scleroderma, Goodpasture's syndrome, and cystinosis. No attempt has been made to separate these high risk patients in calculating survival statistics.

The ethnic distribution of program entrants is depicted in Table II, and does not differ significantly from the ethnic

Table II		
Ethnic Distribution		
	No.	Percent
Caucasian	112	58.9
Mexican American	40	21.1
American Indian	14	7.4
Negro	10	5.2
Mexican	10	5.2
Chinese American	4	2.1
	190	100

distribution of the population of our service area. Table III shows the geographic distribution of entrants. Most entrants in our program from northern

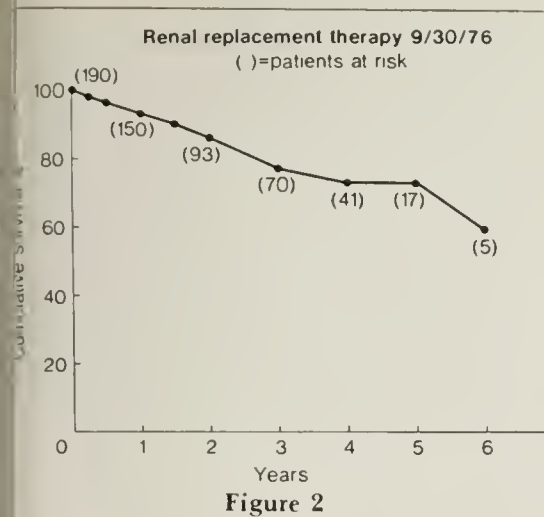
Table III		
Geographic Distribution		
Arizona Counties		
Pima		98
Maricopa		28
Cochise		15
Pinal		8
Yuma		7
Gila		3
Graham		3
Apache		3
Santa Cruz		3
Greenlee		1
Mojave		1
Navajo		1
Yavapai		1
Coconino		0
Arizona Total		172
Mexico		12
Out of State		6
Total		190

Arizona were veteran patients or American Indian patients admitted to the Veterans Administration Hospital through an arrangement between the Public Health Service and the Veterans Administration.

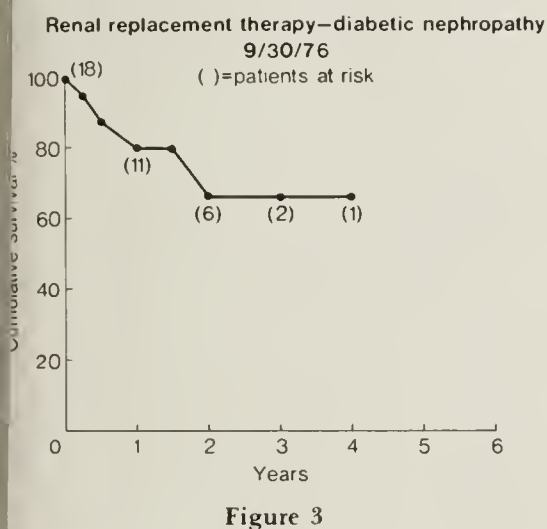
Figure 2 depicts the cumulative survival curve for all program entrants for all types of renal replacement therapy whether the patient survival was achieved by a single type of therapy or several types at different times. The numbers in parentheses indicate the number of patients at risk at each time interval. Figure 3 shows the survival curve for all diabetic program entrants for all types of renal replacement therapy.

Hemodialysis:

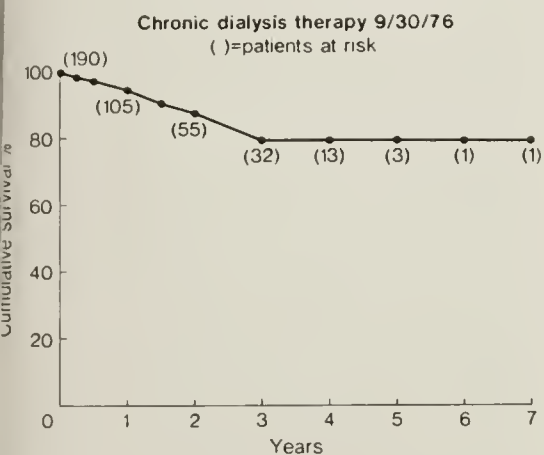
The survival curve for patients treated by chronic hemodialysis, including hospital center dialysis, limited care center



Calculated cumulative survival for all program entrants achieved by all modalities of renal replacement therapy. The numbers in parentheses indicate the number of patients at risk at each time interval.



Calculated cumulative survival for all diabetic program entrants achieved by all modalities of renal replacement therapy. The numbers in parentheses indicate the number of patients at risk at each time interval.



Calculated cumulative survival attributable to hemodialysis. The numbers in parentheses indicate the number of patients at risk at each time interval.

dialysis, and home dialysis, is depicted in Figure 4. All program entrants were started on hemodialysis. Those transplanted successfully, most of whom were transplanted in the first few months after initiating dialysis (Figure 5), were treated for survival analysis purposes as withdrawn alive with respect to dialysis

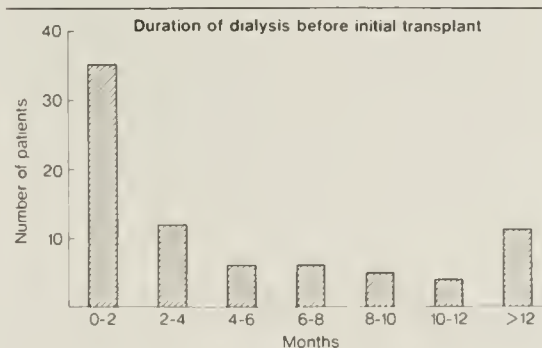


Figure 5
Duration of hemodialysis prior to initial transplantation in all patients treated by transplantation.

survival, thus rapidly reducing the number at risk as reflected by the numbers in parentheses on the graph. Those whose transplant functioned for 1 month or less were considered for dialysis survival purposes as never having left dialysis, and all survival was credited to dialysis. Among this group, those who expired of obvious transplant complications were withdrawn alive from dialysis, and their death was credited as a transplant death. Those who returned to dialysis and subsequently expired of non-transplant related causes were credited as dialysis death.

Of the 190 patients starting dialysis, 39 or 21% have been trained for and successfully performed home or self-care dialysis.

Table IV details the causes of death in the 16 chronic dialysis patients who have died since the inception of the program. It is noteworthy that 8 of the 16 patients or 50% had been designated high risk patients at the time of entry in the program.

Table IV
Deaths — Chronic Dialysis Patients

Major Vessel Events	
CVA	5•••
Acute MI	3•
Sudden Death	1•
Other	
Dementia Dialytica	2
Electrolyte Imbalance	1•
Blood Access Failure	1
Pneumonia	1
Amyloidosis	1•
Scleroderma	1•
Total	16

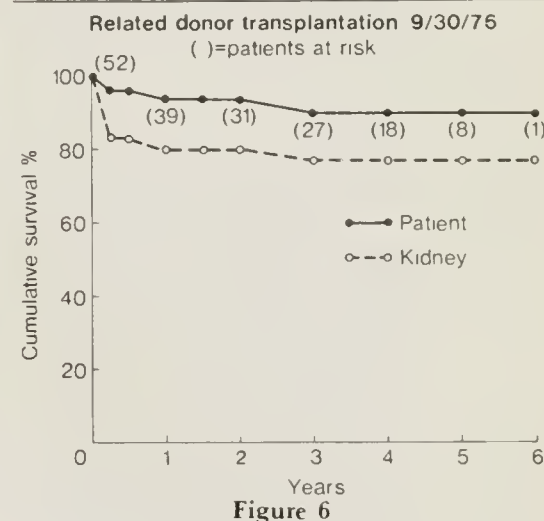
•High Risk Group

Transplantation:

A total of 86 transplants were performed in 79 patients. Thus, 41.6% of program entrants received a first transplant. Seven

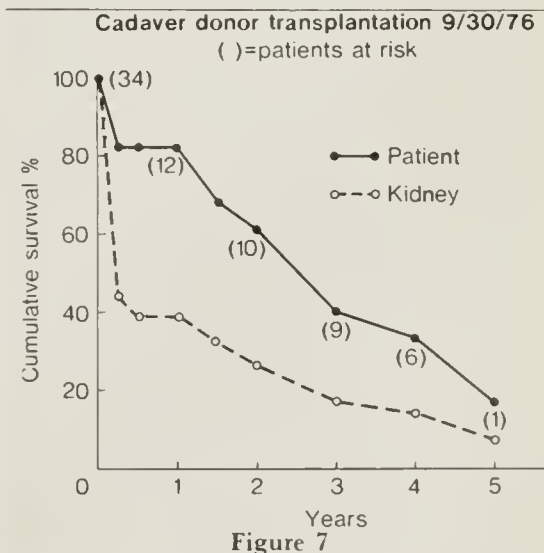
patients or 3.7% received a second transplant, and no third transplants were performed. Fifty-two of the 86 transplants, or 60.5%, were from living related donors, and 34, or 39.5%, were from cadaver donors. Figure 5 shows the duration of hemodialysis prior to the initial transplant and indicates that 48% of initial transplants were performed within 2 months and 60% within 4 months of starting dialysis in our program.

Figure 6 depicts patient and kidney survival following related donor trans-



Calculated patient and kidney cumulative survival in related donor transplantation. The difference between the two lines represents kidneys lost but patients successfully returned to hemodialysis. The numbers in parentheses indicate the number of patients at risk at each time interval.

plantation, and Figure 7 gives corresponding curves for cadaver donor transplantation. The difference between the two lines of each graph represents transplants lost but transplant recipients salvaged by



Calculated patient and kidney cumulative survival in cadaver donor transplantation. The difference between the two lines represents kidneys lost but patients successfully returned to hemodialysis. The numbers in parentheses indicate the number of patients at risk at each time interval.

return to hemodialysis. It is readily apparent from the cadaver donor graph that 58% of these organs and 18% of recipients of these organs were lost in the first 3 months after transplantation. Both

patient and transplant survival are roughly 1:2 as successful with cadaver compared to related donor transplantation. Table V lists causes of the 16 deaths occurring in transplant patients since the inception of our program. It is worthy of comment that 2 of the 3 patients dying of coccidioidomycosis also had diabetes mellitus.

Table V

Death — Transplant Patients

Major Vessel Events	
CVA	2
Acute MI	1
Sudden Death	2
Infectious	
Coccidioidomycosis	3**
Septicemia	1
Meningitis	1
Chronic Hepatitis	1
Other	
Perforated Colon	1
Small Bowel Infarct	1
Gangrene of Leg	1
Hemorrhage	1
Carcinoma — Lung	1
Total	16

*High Risk Group

Our program of renal replacement therapy has provided a total of 348 years of extended life through September 30, 1976. Of this, 201 years or 58% has been accomplished with chronic hemodialysis, 110 years or 31% with related donor transplantation, and 37 years of 11% with cadaver donor transplantation.

DISCUSSION

The concept of a coordinated, patient oriented program of renal replacement therapy presented in this study is unique. We can find no report which embodies the principles of our program, or which reports program survival results as opposed to results with individual types of therapy.

Coordination refers to the integration of hospital, out-patient, and home hemodialysis, and of related donor and cadaver donor transplantation, including facilities, critical staff, and most importantly philosophy, to make each therapy ideally available to each patient. Patient oriented approach encompasses access to the program and availability of all facilities and types of therapy including change from one facility or type of therapy to another when appropriate, with the simple goal of the greatest possible extension of life worthwhile to the patient. The term renal replacement therapy emphasizes the need of the patients in the program, and deemphasizes physician or other health practitioner self-interest in the several components of renal replacement therapy. It permits relegation of the component parts of therapy to their proper place as means to the goal of patient longevity rather than as goals themselves.

This program approach then permits analysis of program results including numbers of entrants (Table I), age (Figure 1), ethnic composition (Table II), geographic representation (Table III), and of most importance, survival results (Figure 2). There are, of course, many reports of dialysis and of transplant survival results, but none of overall renal replacement therapy program results. To the extent that reports of dialysis results might fail to statistically account for some patients who underwent transplant successfully or unsuccessfully shortly after starting dialysis; since subsequent care and outcome may have been at the transplant facility or another dialysis facility; and to the extent that transplant facilities might return unsuccessful transplant patients to a dialysis facility and then be unaware of subsequent transplant related mortality; one is unsure that reports of dialysis or transplant survival results accurately reflect survival of patients requiring renal replacement therapy.

Our program survival results include all patients requiring chronic renal replacement therapy and actually entering such therapy. The results are not qualified by separating elderly or otherwise high risk patients, and, in fact, 36% of the group were high risk patients at the time of entry as usually classified in other centers. Nonetheless, the 1 year survival of 93%, 2 year survival of 86%, 3 year survival of 77%, 4 year survival of 73%, and 5 year survival of 73% appears better than almost any reported result with any of the individual types of therapy. We believe a 73% five year extension of life to be excellent in an otherwise 100% fatal disease. Moreover, we attribute this excellent result to our integrated program approach to end stage renal disease.

Patients with end stage renal failure due to diabetic nephropathy constitute an increasing number of those presenting for renal replacement therapy in our and other programs. There is considerable interest in the relative roles of dialysis, transplantation, and extraordinarily early transplantation of these patients in morbidity and survival results.⁴⁻⁵ Our group is still too small to reflect any relative advantage of dialysis as opposed to transplantation, but our integrated program approach has produced an excellent survival result in 18 patients (Fig. 3), with survival at 1 year of 80% and at 2 years of 66%. These results have been achieved despite the geographically unique problem of coccidioidomycosis, and the particular propensity of immune suppressed diabetic patients to develop disseminated coccidioidomycosis.⁶

The input rate in our program (Table II) continues to increase in excess of the general population increase in our service area. If the population of our service area is approximately 415,000 non-veterans

(83% of 500,000) and 375,000 veterans (17% of Arizona's 2,200,000 population), and assuming all veterans requiring renal replacement therapy enter our program then we entered 53 patients per million population during 1975, and 77 per million population per year during the first 9 months of 1976. The 1976 figure is in excess of that experienced in Scotland (52 per million),⁷ or Northern Ireland (38 per million)⁸ where all suitable candidates were treated, and is in excess of most government and other estimates or experience in this country.

There is neither agreement nor uniformity concerning what portion of program entrants should be or are suitable for the several types of renal replacement therapy. Many factors, including previous results with specific types of therapy in the program and in other programs, patient preference, and physician preference influence the type or types of therapy for each patient. In general, and in most programs, patients over age 55 to 60 are not considered transplant candidates. This practice is probably predicated more on the inavailability of suitable related donors and the limited availability of cadaver donors than on any demonstrated greater mortality of the elderly with end stage renal disease treated with transplant as opposed to dialysis. Nonetheless, the increasing age of entrants in our program in the past 2 years has led to a decrease in the per cent, but not the actual number, of patients transplanted. The overall transplant rate of 42% and the home trained rate of 21% in our program reflects our great interest in removing the patient from the hospital or out-patient dialysis center environment and permitting rehabilitation to the home environment.

Results of specific types of therapy within our program have been analyzed to permit identification of specific problem areas and as an aid to patient and staff decisions in recommending therapy to individual patients. Our survival results with chronic hemodialysis are considerably in excess of those reported by a large series from fourteen dialysis centers;² those reported by the National Dialysis Registry;⁹ those reported by the Registration Committee of the European Dialysis and Transplant Association;^{10,11} and several large centers.^{12,13} Our survival results with related donor renal transplantation are excellent and are considerably in excess of those reported by the Transplant Registry,¹⁴ the Registration Committee of the European Dialysis and Transplant Association,^{10,11} and several large transplant series.^{12,13} On the contrary, our patient survival results and our kidney survival results with cadaver donor transplantation have been poor and considerably below those reported by the Transplant Registry,¹⁴ the Registration Committee of the European Dialysis and Transplant Association.

tion,¹²⁻¹⁵ and other centers.¹² Our relatively poor results from cadaver transplantation have been more than offset by our better results with other therapies, as reflected by the overall survival results of our program.

Management of patients receiving cadaver transplants is by the same physicians and other health care practitioners as those receiving related donor transplants. Thus other factors may influence our results with cadaver transplantation. Selection of patients receiving cadaver donor transplants favors the diabetic patient, and

others in whom the risk is judged too great to justify use of a related donor, even if potentially available. In addition, there is a local reluctance, almost a total unwillingness, to pronounce brain death. This compromises the quantity and probably the quality of organs available for cadaver transplantation, limiting the team experience with cadaver transplants, the viability of organs transplanted, and probably the results of cadaver transplants in our program. This poor result has, of course, also limited patient and physician enthusiasm for cadaver transplantation.

SUMMARY

A coordinated, patient oriented, program of renal replacement therapy in southern Arizona has been described with regard to number of entrants and entry rate, age, ethnic and geographic composition, and survival results.

The cumulative program survival results for 190 patients of 93% at 1 year, 86% at 2 years, 77% at 3 years, and 73% at 4 and 5 years rival results reported for any single modality of treatment for end stage renal disease and are attributed to the integrated program approach to renal replacement therapy.



Seminars in Gastroenterology and Liver Disease

DIABETES MELLITUS AND THE GASTROINTESTINAL TRACT

PART I

ESOPHAGUS AND STOMACH

STEPHEN GLOUBERMAN, M.D.

LEON RIGBERG, M.D.

STEPHEN GLOUBERMAN, M.D.

GEORGE BURDICK, M.D., EDITORS

Some patients with diabetes mellitus have symptoms referable to the gastrointestinal tract, and many more have biochemical, radiologic or manometric evidence of enteric dysfunction. No definite figures are available on the overall incidence of GI manifestations in diabetes, and less is known of the etiology of these abnormalities. Most diabetics with GI problems have them as relatively minor ones, with the cardiac, hypertensive, renal, retinal and peripheral neuropathic complications of diabetes predominating. In this review, the role of diabetes on the various organs of the GI tract will be reviewed and, in some instances, the effect of dysfunction of various organs on the metabolic defect will be discussed.

ESOPHAGUS

The first paper to describe esophageal abnormalities in diabetes appeared in 1967 when 14 diabetics with peripheral neuropathy and gastroenteropathy were studied radiologically.⁴ Three had symptoms referable to the esophagus. The average duration of diabetes in these 14 patients was 16 years. Twelve of the 14 had

cineradiographic abnormalities. There was an abnormality of the primary peristaltic wave in all 12, with three having aperistalsis. Tertiary contractions were present in seven, and in one of these it occurred frequently. Eight had delayed emptying of the esophagus when recumbent, with barium still present in the esophagus after 20 seconds. A few had retention in the upright position. The initiation of swallowing and the upper esophageal sphincter was normal. Eleven of the 14 also had gastric dysfunction, and 4/14 had radiologic small bowel abnormalities. No correlation was found with other GI abnormalities, the presence of esophageal symptoms, duration of diabetes, type of therapy, or other diabetic manifestations.

Ten of these patients were restudied nine months to three years later.⁵ Radiologically the previous abnormalities had further deteriorated, and more patients were symptomatic. Eight of these ten underwent esophageal manometry. Multiple abnormalities were found compared to controls. The amplitude of pharyngeal contractions was diminished in the diabetics, and no overlap was seen with controls. The duration of the pharyngeal contraction and the upper esophageal sphincter pressure were similar in the two groups. The duration of upper esophageal sphincter relaxation was less in the diabetic group. Less swallows were followed by primary peristalsis in diabetics than in controls. The average intraluminal pressure at each centimeter of the esophagus was less in the diabetics. More patients with diabetes than controls had spastic contractions. The effective lower esophageal pressure (defined as the pressure in the lower esophageal sphincter minus the intragastric pressure) was significantly less in the diabetics. This study showed that patients with diabetic esophagopathy tend to progress with time.

Patients without esophageal symptoms or other manifestations of GI disease have also been found to have motility abnormalities.⁶ Weak or absent primary peristalsis in the cervical and thoracic esophagus and decreased lower esophageal

sphincter pressure are found in over 80%, and this has been suggested as a triad characteristic of diabetes. Not all studies, however, have shown a difference in radiologic and manometric abnormalities in diabetics as compared to controls.

In summary, most patients with diabetes have no symptoms referable to the esophagus. When it does occur it is most likely to be due to gastroesophageal reflux caused by the lowered lower esophageal sphincter pressure and usually associated with a hiatus hernia. This is treated in the same way as gastroesophageal reflux in non-diabetics, i.e., by encouraging weight reduction, cessation of cigarette smoking, elevation of the head of the bed, consumption of small meals, antacid administration, and alginic acid foam tablets.

STOMACH

Approximately 30% of diabetics have abnormal, weak gastric motility as shown by an enlarged stomach on x-ray, loss of rugal patterns, sluggish peristaltic activity retained secretion, and barium present in the stomach six hours after an upper GI series.¹ Organic obstruction is absent as is shown by a patent pylorus and the ability to manually express the barium into the duodenum. Most of these patients are asymptomatic but a few have symptoms of epigastric fullness; rarely is it severe with associated nausea and vomiting. Patients usually have other GI manifestations as well as associated peripheral neuropathy. Hyperglycemia, elevated levels of glucagon and visceral neuropathy have been proposed as mechanisms. Bacterial overgrowth in the stomach is present in up to 10%. Delayed gastric emptying may result in marked difficulty in controlling the diabetes, with the brittleness attributed to irregular emptying of food into the small intestine. Cholinergic therapy is variably helpful in symptomatic cases. Surgical creation of a gastroenterostomy or a pyloroplasty has recently been shown to be effective in patients with severe symptoms.⁷

Patients without peripheral neuropathy tend to have rapid gastric emptying.⁸ This

group generally has hypochlorhydria. The proposed mechanism is decreased duodenal acidification resulting in less inhibition of gastric motility by small bowel humoral factors. As time progresses, gastric motility per se becomes impaired and gastric emptying is delayed. The mechanism of this impaired motility in one-third of diabetics is unknown.

The majority of studies have shown that diabetics have diminished gastric acid output.⁹ These values are related to the blood sugar and presence of diabetic complications, i.e., acid output is less if the blood sugar is elevated or complications present.

Seventeen per cent of diabetics are achlorhydric to maximal histamine stimulation,¹⁰ and this too is related to the level of blood sugar. Hyperglycemia and glucagon are both known to lower acid output, with the former probably working centrally via the vagus, and the latter via a depressant effect on gastrin output.

Up to 85% of diabetics have evidence of gastritis on mucosal biopsies, and al-

though this is higher than controls, it is usually not statistically significant. Acid output has been found to be directly related to the histology of the fundal mucosa with higher degrees of gastritis being associated with decreased amounts of H⁺ ion production.¹¹ Gastritis is not related to the severity or duration of diabetes, but is age related. The older the diabetic, the greater the incidence of gastritis, either superficial or atrophic. However, atrophic gastritis is found commoner in younger diabetics than in age matched controls, and in one study 11/19 diabetics under age 40 had atrophic gastritis.

Antibodies to gastric components are also higher in diabetics than non-diabetics.¹² About 25% of diabetics have circulating parietal cell antibodies whereas only 8% of controls do. The corresponding figures for intrinsic factor antibodies are 8% and 0%. In basal states and after pentagastrin administration, less intrinsic factor appears in the gastric juice.¹³ This need not be in the same patient with IF antibody, suggesting that this may not be

on an immunologic basis, but rather related to the gastritis. Vitamin B¹² levels are normal in over 95% of patients with decreased IF production. Generally, patients with IF antibody have diabetes of long duration and with complications but it is often seen also in young diabetics below the age of 40. This follows the distribution of atrophic gastritis.

As a corollary, pernicious anemia is found with a frequency of 3-6 times greater in diabetics than controls.¹⁴ This is probably related to the high incidence of atrophic gastritis in diabetics. Uropepsin levels are also decreased in this group.

A factor frequently implicated in the GI complications of diabetes is vagal neuropathy. Some evidence for this is shown by the fact that the output of acid and IF following pentagastrin stimulation is significantly greater than that following insulin-induced hypoglycemia. Furthermore, the basal acid levels and pentagastrin stimulated levels are less in diabetics than in controls. A second factor is the occurrence of gastric microangiopathy.

Bibliography available upon request.



Drug Therapy Problems

ROBERT E. PEARSON, M.S., R.Ph.

Most practitioners rely upon their own reading plus other external sources to assist them in their quest to remain abreast of the biomedical literature. This feature is intended to provide finite information, to answer some questions, and to stimulate awareness of the availability of an unbiased source of biomedical information. The format will include: questions and answers, with the questions being provided by the readers and/or users of our service; abstracts from the literature; brief descriptions of newly-marketed items; brief discussions of new innovations in therapy; and short exercises regarding specific drug products.

Q. Is there a limit to the amount of sorbitol that a diabetic patient can use as a daily sucrose replacement?

A. Sorbitol is a hexahydric sugar alcohol which does not significantly increase blood sugar after oral administra-

tion. Diabetic patients whose disease was well controlled ingested 36 — 54 g of sorbitol daily with no significant effect on blood sugar concentration or on insulin requirements. Single doses of 30 — 50 g have been used as a laxative. The Seventh Report of the FAO WHO Expert Committee on Food Additives gives the estimated acceptable daily intake of sorbitol in man as up to 150 mg/kg body weight.

(Martindale, *The Extra Pharmacopeia*, The Pharmaceutical Press, London, England, 1972, p. 79-80)

Q. A visitor from Germany was referred to my office for evaluation. She has been taking a drug called Neurocil at bedtime. I think it's a phenothiazine, however. Can you identify it?

A. Neurocil is known in this country as Levoprome[®] (methotrimeprazine). It is available only in injectable form. The manufacturer recommends it for the relief of pain in non-ambulatory patients. Sedation is one of the more frequent side effects.

ABSTRACT OF INTEREST: Paterson, I. C., *et al*: Severe Bronchostriction Provoked by Sodium Cromoglycate, *Brit Med J* 2:916, 1976.

A 42-year old male with chronic asthma was treated for 12 months with sodium cromoglycate (cromolyn sodium, Intal[®] or Aarane[®] in the U.S.) at a dose of 20mg four times daily. The drug was then stopped, and for 15 months a corticosteroid aerosol was utilized. Sodium cromoglycate was reinstituted because of a recurrence of asthma, and one month later, the patient became breathless and wheezy immediately after a dose of sodium

cromoglycate. Upon investigation, the patient showed no reaction to the administration of the lactose vehicle, but there was a significant fall in FEV₁ because of the sodium cromoglycate administered without the lactose vehicle. Pre-treatment with salbutamol and chlorpheniramine prevented the fall in FEV₁ after a challenge dose of sodium cromoglycate. Atropine did not prevent the fall in FEV₁ under the same conditions.

ABSTRACT OF INTEREST: Lieberman, A., *et al*: Treatment of Parkinson's Disease with Bromocriptine, *N Eng J Med* 295:1400-1404, 1976.

A six month trial of bromocriptine in patients whose disease was progressing despite levodopa or levodopa carbidopa therapy is reported. Average levodopa dosage was 4000mg per day, while levodopa carbidopa therapy averaged 1300mg/100mg (respectively) per day. Bromocriptine dosage was begun at 5mg per day and increased by 5 — 10mg per day. At a dose of 25mg per day, it became necessary, because of side effects to begin reducing the dosage of levodopa or levodopa carbidopa. For each increment of 5 — 10mg of bromocriptine added, the levodopa was reduced by 125 mg and the carbidopa by 12.5mg. Maximum dosage of bromocriptine was 100mg, with a mean dose of 57mg. Fourteen patients participated in the trial. Ten patients were significantly improved with regard to rigidity, tremor, bradykinesia, and gait. In seven of these ten patients, the levodopa/carbidopa therapy was eliminated. Dosage of bromocriptine in these seven patients was 70mg per day. The remaining four patients had the drug discontinued.

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WHY MEDICINE IS AN ECONOMIC MONOPOLY

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The following is a personal viewpoint
and is not to be construed as accepted
policy of the Housestaff Section.

Society seems to impute a terrible connotation to the word 'monopoly.' We dwell in thoughts of price fixing, inability to install our own utilities, having no choice in the desired market, corruptive practices, and the inhumane, cruel prospects of being preyed upon by those who possess control of a monopoly. The greatest collective fear of any monopoly, perhaps, is that *we* may be the next ones to *be* out.

As physicians it may be difficult for us to grasp this fear in terms of medicine. After all, *we* are the possessors of the monopoly of health services; they pose very little threat to us and our families. Before we become appalled at the thought of our being a monopoly, let's decide that *we* are not meaning to imply any moral connotations attached to monopolistic practice. Let us consider the possession of a monopoly with no sense of "goodness" or "badness" as far as health care is concerned. Instead, we shall explore the possibility that indeed medicine does exist as an economic, if not legal, monopoly.

There are at least three types of monopolies. These accrue from a) a privilege granted by the government (e.g., patents), b) the possession of superior skill or talent (e.g., great artistry), or c) the ownership (control) of key resources. Medicine does not lie exclusively within one of these areas, but when viewed as a combination thereof, can be shown in economic terms to exist as a monopoly: licensure is the privilege granted by the government; skill or talent is mostly limited to those accepted in medical schools and ancillary personnel controlled mostly by physicians (who else is given permission to examine patients and devise

treatments, thus developing skills not ordinarily available to the rest of the citizenry?); an ownership of resources exists in the form of the "healing" service, which is predominantly controlled and organized by physicians.

That health care services are controlled in a closed system seems too obvious to have to mention. Information and skills are the cornerstone of medicine. The access of the general public to true understanding and acquisition of this information and these skills is extremely limited. For us to say, "they can buy the same books and subscribe to the same journals" is technically correct, but suffers poorly in reality testing. Most persons would be unable to decipher these texts or journals without considerable personal resource allotment. Furthermore, most people simply are not anymore interested in studying about health than some of us are about learning three new languages. Even if no individual were interested in knowing all there is to know about a recently acquired illness, or making a well-informed decision about treatment, he rarely, if ever, can divorce his feelings from the decision which is applied to his family, friends, or himself.

An additional aspect of monopolistic tendencies in medicine results from the considerable restriction of competition in health care. Admissions to medical schools are severely limited as compared to the interest of the qualified to attend.¹ Licensure to perform certain tasks and treatments maximally restricts what non-MDs can do. Hospital privileges are frequently apportioned according to the economic impact they may have on those physicians already in the hospital.² Advertising of health services is prohibited, thus, decreasing a patient's awareness of any differences in economic or qualitative considerations of a service.³

Beyond licensure, privileges, access to information, skill development, and advertising, the physician is in a relatively unique position in the U.S. economic system in that he is the essential purchaser

of services for the individual; that is, he not only controls access to the system, but controls continued utilization of his resources. Through inadvertent comments or poignant deliberations the physician makes it known that the patient should have come in sooner ("Why did you wait so long to see me?"), later ("Let's see what happens in the next few days."), or not at all ("You could have gotten by without this visit."). This is an extremely high cost for information—frequently, the only way a person knows if he should see a physician is by seeing a physician. The physician prescribes laboratory and x-ray examinations not otherwise obtainable without a doctor's request and then, he controls the results of such examinations as to exactly what the patient can know even though it is the patient who purchased the service.⁴ The doctor purchases expensive new equipment and treatment procedures for the community. Finally, he determines when the patient should return to utilize the physician's own services and at what fee that service is to be rendered. As Rashi Fein, renowned health economist, sums up, "The consumer's utilization of services is largely dependent on physician decisions. The physician (businessman) is one of the relatively few American entrepreneurs who can expand the demand for his services (and without advertising or at the expense of a competing firm)."⁵ Furthermore, the physician controls my access to his services by detailing his office hours, denying me house calls, refusing to serve in my rural area, etc.

Perhaps a good test of physician control is the following: I feel ill. I describe my symptoms and signs to myself. I look up the various possibilities for the cause of these symptoms and rationally and scientifically determine that my illness emanates from a bacterial infection. (We shall presume that I am correct in my interpretation.) There is no way I could a) confirm that diagnosis, or b) receive appropriate treatment because of my lack of access to a laboratory for culture and sensitivity and my inability to obtain the appropriate antibiotic without a licensed physician's signature on the prescription.

Because they are the sole sources of a particular product or service, non-governmentally controlled monopolies have exclusive control for the quality of that product or service. Though Professional Standards Review Organizations legislation may be changing the scene a bit, physicians are still the controllers of

1. There were 42,303 applicants for 15,351 admissions places in 1976. The author has been told by several admission officers that an estimated 75-80% of the applicants would be qualified for acceptance if there were sufficient numbers of places available.

2. For example, when a new neurosurgeon comes to town and there are already two with plenty to do, they do not want another neurosurgeon around to cut down on their patient load and income. This is understandable from the neurosurgeons viewpoint, but it limits the patient's choices and could maintain artificially higher prices for the physicians services. Similar 'share-of-the-pie' disputes have been seen in the recent past between the development of family practice residencies in small communities and the established practitioners of the areas.

3. The arguments for and against professional advertising are manifold. There is little doubt that advertising of products attempts not just to increase profits, but also to distribute information to the public in terms of various features of the product—cost, quality, comparison with similar products, etc.

4. After most testing procedures results are sent only to the physician for "interpretation" to the patient. Some persons may present well-substantiated arguments for such tactics, but the fact is that it is the physician who controls resources of purchasing and revealing the results of such services

5. Fein, Rashi. "On achieving access and equity in health care." In *Economic Aspects of Health Care*, J.B. McKinley, editor. New York: Prodist, 1973. p. 42.

the quality of care given to their patients. This occurs via subtle modes (for example, licensing of medical schools thus pre-setting standards of education and mandating certain educational particulars as necessities for licensure) as well as, through more open methods such as development of standards of acceptable care within the community. These standards exist not solely in the area of hospitalization, but also in socialization through validation services to third parties in providing judgment concerning a person's health status. Physicians place the particular badge of sickness or disability or health on the frock of the patient allowing him to acquire the benefits of Blue Cross, workman's compensation, or a well-paying job, respectively. Society has culturally imbued this right upon the physician. And the consumer cannot get the above-named benefits without physician validation—another aspect of the control of the health care market by the providers.

Quality of care is not an easily evaluated aspect of health care by the consumer. This is true not solely because of his ignorance of the medical market, but also because of the revolving dispute of quality within the profession. There are very few, if any, illnesses for which modes of treatment are fully accepted by all practitioners. Even where they are well accepted, they are not necessarily scientifically accurate. Where there are multiple modes of therapy, how often do we give the patient the choice as to which will take precedence?

Finally, monopolistic tendencies in medicine exist by the industry's control of prices. Certainly, this author does not suggest that an outright, backroom, nefarious conspiracy exists to maintain prices for particular services at relatively equal levels by all practitioners. However, reality suggests that prices have been supported at high levels by various subtler methods: fear of ostracism by the rest of the medical community for charging lower than "acceptable" prices is one. Others include the publication of "suggested" relative price scales by several subspecialty societies, and relative reimbursement scales as used by third party payers.

Normal inflationary trends would predict physicians' fees have risen much less than they have in the past quarter century. Fuchs states that "physicians' fees have risen more than twice as fast as other consumer prices since the end of World War II and . . . (physicians') incomes have almost doubled in the last decade."⁶ The consumer price index for all items in 1974

was 147.7, whereas, for medical care it rose to 150.5 and for physicians' fees 159.1.⁷ Physicians have been in the position of getting what they demand for their services for a long time. The only exception was, of course, the price and wage freezes of the Nixonian early 1970's. Some of the privileges of physicians may be slowly edging away via government bureaucratic regulations in reimbursement practices and third party payer increased involvement with consumers in decision-making positions.

Up until this point, we have maintained an assumption that the health care monopoly is not necessarily a 'good' or 'bad' practice. Through restricted entry, trade, quality assessment, and control of continued services, we have seen how the health care establishment, with the physician as its team leader, has, for better or for worse, cornered the market. If a value judgment need be applied to this situation (and we all do judge either complacently or actively) this author would suggest that the overall risks of the health care system as a self-controlled monopoly outweigh the benefits of a centrally-controlled system. Monetary incentives are not necessarily poor incentives for advancing a cause. However, there is, and needs to be, a point past which society will not continue to purchase such high-priced services without demanding greater control. Theodore Roosevelt elaborated on this when he stated that the monopolistic tendencies of business ". . . must never be allowed to grow stronger than the state; they must yield to its superior moral force."⁸ If, because of the existing situation, consumers fear that they will not be able to obtain health services when they need them, or afford them once they are available, or control their own bodies because the health care industry has expropriated the autonomy of the individual, they then must decide to remedy the situation via publicly-mandated government intervention.⁹

We have not touched upon the reasons, many well-founded, that the various health care monopolistic tendencies have developed. Certainly, we can all probably cite cases where this or that monopoly may have been necessary for society's well-being. We can show a case of this or that illness wherein the patient initiated and maintained full autonomy. But anecdote distorts the broader perspective achieved when we step back to view the whole picture. That picture, this author believes, confronts us with the inescapable conclusion that, as it exists, health care is an economic monopoly.



Editorial

CONTROLLING THE SUPPLY OF HOSPITAL BEDS

JOHN W. KENNEDY, M.D.

This is the title of a report just released by the National Academy of Sciences and it concluded that "significant surpluses of short-term general hospital beds exist or are developing in many areas of the United States and that these are contributing significantly to rising hospital costs". The majority opinion offered as a solution is "an overall reduction of at least 10% in the ratio of short-term general hospital beds to the population within the next 5 years and further significant reductions thereafter".

Well, this will be music to the ears of the Health Planning Agencies, and perhaps not so welcomed news to the hospital empire builders. The report further urges the health planning organizations to see the light and use the influence that they possess under federal and state health services legislation to reduce the bed inventory; this is the interpretation of D.S. Greenburg in a recent number of the *New England Journal of Medicine*.

This is pointed out as a possible way in which the inordinate increase in hospital costs could be limited, simply by not supporting unoccupied beds.

Then it is hoped that within a few years there would be waiting lines at the hospital doors for non-emergency surgery.

Everyone is looking for ways to reduce the inordinate increase in cost of medical care, but if long waiting lines at the doors of hospitals, waiting for elective surgery or medical treatment, if this was the means of reducing medical care, then Great Britain instead of being bankrupt, should be on easy street. Everyone knows that the waiting time there may not be days or weeks, but months or years for elective

6. Fuchs, Victor. *Who Shall Live? Health, Economics, and Social Choice*. N.Y.: Basic Books, 1974. p. 58. Note that in contrast to the rise in physicians' fees, the overall consumer price index increased by only 36% from 1965 to 1975.

7. Mason, Henry R., ed. *Socioeconomic Issues of Health 75-76*. Chicago: American Medical Association, 1976. p. 171.

8. Hofstadter, Richard. *The American Political Tradition*. New York: Vintage Books, 1973. p. 273.

9. See my previous argument "Rationale for Government Intervention in Health Care" in *Arizona Medicine*, November, 1976. pp. 931-3. In this article, I attempt briefly to develop the interactions of public priorities and subsequent control by government of private enterprise.

urgery and yet every serious student acknowledges that their health system has been a major contributor to their now defunct economy.

Not all hospital administrators take such a dim view of this, in fact R.M. Cunningham, Jr. writing in "Modern Health Care," a hospital-oriented journal, writes in the following manner: "... so that a few hospital people have been considering recently is the advisability of picking up the ax themselves. What if we were to declare a moratorium on building, creating the HSA or state agency, or whatever it may be to the punch? We'd have a better chance of being selective, of making sensible rules for exceptions, so the fewest people would get hurt. We would have to make some sacrifices, and we would have a lot of problems. But we are going to have the problems anyway and we would look a lot stronger that way than we do now.

"And what if we took the initiative in commending elimination of unneeded, uneconomic hospitals? Again, we would make some enemies, but we would do a better job of picking the places that ought to be closed than anybody else can do. Some of them are going to be closed anyway—some already have been, and this kind of action by the industry itself would give everything about our cost containment effort a lot more substance and credibility than any of it has now."

Returning to the National Academy of Science report, excerpts from it state, "Powerful influences exist within communities to build new hospitals or hospital additions and to keep existing institutions fully functioning regardless of their efficiency or their financial viability. Community pride is having a new hospital—desires of consumers and physicians to have the best possibility facility conveniently nearby—competition among hospitals to have the latest facilities and technology."

"No one realizes how difficult it is to close a bed. A hospital is a monument and one observer noted that in "Connecticut it took 10 years to close two of the state's thirty-five maternity units, but in the mean time, two others were created".

It is, indeed, very difficult to close a hospital bed, and a sacrosanct hospital may not be closed in the fair state of Arizona even though the utilization may be less than 50%, if we can judge by some past experiences.

A more recent cry has been the fear of impact of the increased placement of C.T. scanners, the new revolutionary radio-graphic diagnostic unit. The proliferation of these, it is thought, will increase health bill in Arizona inordinately.

Some day perhaps we will have to decide how much we can really afford for hospitals, for exotic laboratory and radio-graphic tests and for treating incurable conditions.

COMMENTS FROM THE AMA

Our profession today is being smeared by a brush that has gone haywire.

We have called and worked for crack-downs on Medicaid-Medicare fraud and other abuses of our ethical standards—yet we are being tainted with "guilt by association" simply because the abusers include doctors.

While political hay is being made out of the abuses, our efforts against them are mostly ignored and even circumvented by politicians. Judicial roadblocks also have been placed in our way.

The House of Delegates of the American Medical Association, at its convention last June, urged government agencies to prosecute Medicaid-Medicare defrauders with due speed and offered the Association's cooperation.

HEW has set up a special fraud office, and Congress this autumn provided for an Inspector General of all HEW programs, particularly Medicaid. But how effective can government be, aside from finger-pointing at the Medicaid-provider incomes and televising its fists?

Well, Senator Sam Nunn (D.-Ga.) recently expressed the belief that fraud is "pervasive at all levels" of Medicaid administration, including HEW's program to detect it.

James H. Sammons, M.D., executive vice-president of the AMA, has bluntly stated:

"We are tired of doctors being made the whipping boy by publicity-seeking bureaucrats and politicians. If they want to clean up Medicare and Medicaid, let them go after the Medicaid-mill and nursing-home operators who prosper in every major city with political protection. That's the root of the corruption and the fraud and abuse."

The AMA has equipped state medical societies with two pieces of model legislation to toughen the disciplinary powers of state licensing boards. How many states have adopted them?

Even so, license revocations and other disciplinary actions reported by state medical boards jumped from 179 in 1974 to 246 in 1975 to 335 in the first eight months of 1976, according to the boards' National Federation. And, for the most part, there are only M.D.'s on those boards.

Physician members of the PSRO in New York County have tried to use powers conferred by the PSRO law to control Medicaid-mill abuses. But their efforts have been stymied by state and city officials or by the courts.

Some politicians choose to be unaware that medical societies have conscientious, stringent committees on credentials, grievances, and ethics.

Let's work as best we can with government and insurance carriers to show our concern—and to push for a cleanup.



Letters to Editor

Dear Colleagues:

It was not a shining example of representative democracy. The terrible truth is that it was an even worse demonstration of participatory democracy.

In April, 1976, the Arizona Medical Association's (ArMA) House of Delegates voted to poll the state's physicians for an opinion regarding mandatory membership in the American Medical Association (AMA). Forty-three percent (43%) of ArMA's physicians responded and 61.3% of Arizona doctors (784 vs 448) favored *voluntary* membership. The ArMA Board of Directors drafted the necessary by-laws changes and called the delegates to meet November 20, 1976. It would be a natural assumption that if the House of Delegates asked for guidance that they would act accordingly; thus many of the 159 delegates and directors elected to skip the special meeting at ArMA headquarters. Thereby hangs our tail (sic), by a vote of 32 to 24 a motion to maintain the *status quo* was passed.

Please note the issue is not the demise of the AMA! Over 40 states have voluntary membership and the AMA is stronger than ever. Some physicians feel that the AMA is stronger and acting tougher precisely because its mandatory membership cannot be taken for granted in 44 states.

If you feel that your worst suspicions about the boys in the back room at ArMA have been confirmed, don't bad mouth your state officers who work hard in trying times with no recompense and little thanks. Talk to your ArMA delegate or become one yourself. If the organization doesn't reflect your views, then get a firmer grip on the handle of the mirror.

Perhaps mandatory membership in AMA is what we want, but let's see it affirmed by a vote of 104 to 24 — not 32 to 24 when the poll says "no".

Sincerely,

Neil O. Ward, M.D.

UNIFIED MEMBERSHIP — DOES MAJORITY RULE?

An open letter to the Membership of the Arizona Medical Association.

"THE HOUSE OF DELEGATES OF THE ARIZONA MEDICAL ASSOCIATION, IN A HISTORIC SPECIAL MEETING ON NOVEMBER 20TH, VOTED TO RETAIN THE UNIFIED MEMBERSHIP CONCEPT WITH THE AMERICAN MEDICAL ASSOCIATION. UNIFIED MEMBERSHIP MEANS THAT WHEN A PHYSICIAN JOINS HIS COUNTY MEDICAL SOCIETY, HE AUTOMATICALLY BECOMES A MEMBER OF THE ARIZONA MEDICAL ASSOCIATION AND THE AMERICAN MEDICAL ASSOCIATION."

The above is quoted from the recent issue of "Medical Memos" published by the Arizona Medical Association.

I would like to point out some interesting statistics regarding the stance taken by the House of Delegates of the Arizona Medical Association.

A. ARMA poll regarding the issue of unified membership revealed:

1. Response to the poll was 43.7%.
2. Members — 58.3% *opposed* unification.
3. Non-members — 78.6% *opposed* unification

By contrast, only 35.8% of the House of Delegates voted on the issue.

1. In spite of the above mandate, 57% of the delegates voted to retain unification.
2. If one were to exclude the vote cast by the Board of Directors, the vote would have been 20 to 19 *against* unification.

B. Maricopa County Medical Society poll regarding the same issue revealed:

1. 79% *opposed* unified membership, yet
2. 59% of the delegates from Maricopa County voted *for* unification.

C. The turnout of Delegates who voted on this important issue was a relatively poor 36% (58 of 159). Of the potential 198 (delegates plus alternates) from Maricopa County, a mere 22 or 11% voted. Pima County vote was 3 of 54 or 5.5%.

Many of us who are opposed to unified membership are against it for the very reason demonstrated by what has just taken place. When representatives from any organization take it upon themselves to ignore the mandate of their constituents, then that organization does not deserve the support of the membership.

Let's not have "Big Brother" decide what is best for us. Let the merits of each organization determine whether an individual physician joins and financially supports it, rather than the coercion imposed upon us by mandatory unified membership.

Respectfully submitted,

Howard N. Kandell, M.D.

Statistical information from "Medical Memos" ARMA Correspondence — 12/3/76 Maricopa County Medical Society

For additional comments on this subject see the President's Page January Arizona Medicine, page 18.



Book Review

UNDERSTANDING ARTHRITIS AND RHEUMATISM

Understanding Arthritis and Rheumatism, by Malcolm V. Jayson, M.D. and Allan St. J. Dixon, M.D. New York City: Dell Publishing Co. 1 Dag Hammarskjold Plaza. Nov. 1976. Pages 235. \$1.75 per paperback copy.

Any paperback volume is a bargain; this particular paperback is a great bargain. For less than the price of a blood and guts improbable story, your patient can get a complete, reasoned approach to the problems of arthritic, rheumatic persons, including you and me.

Enough of the anatomy is given so that the patient with back and neck problems can be made aware of what supports him, and where it can go wrong.

Every reviewer should point out some fancied error, just to prove that he actually read the book. Under the chapter on treatment, mention is made that aspirin tablets should not be taken more than three or four times daily, and in doses of two or three tablets. What a switch from my days of observing at West London Hospital Rheumatism Clinic (at that time, and may still be, the largest such clinic in the world) when each patient was given a bottle of 1,000 aspirin tablets and instructed firmly to take at least 16 tablets daily or, more if possible.

The two British rheumatologists give a good, overall view of the recognition and management of all the common and a few of the uncommon musculoskeletal diseases and injuries. You can readily refer your patient's questions to this book, with assurance that only approved forms of treatment are included.

One very helpful section for the patient, and the physician's overworked secretaries and nurses, is that which lists all firms and sources of help and products for the arthritic person.

RALPH L. GORRELL, M.D.



Topics Of Current Medical Interest

SOLAR KERATOSIS

Solar keratosis is one of the most common skin diseases of the aged and is said to be often misdiagnosed, and as everyone who follows the art, here in the sun country is aware, it is indeed very common amongst all ages and the intensity of the sun here accelerates its growth.

The lesions of solar keratosis are carcinoma in situ and the atypical cells are confined to the epidermis and do not invade the dermis according to this authority. Once a biopsy has confirmed the solar keratosis diagnosis the lesion may be treated either with simple excision, electrodesiccation and curettage, or topically with 5-fluorouracil.

The patient should be seen in six weeks after treatment, if any lesions persist, these should be biopsied and excised or treated with electrodesiccation.

So then keratosis is not biologically aggressive, and even if the lesions do break through the basement membrane and develop into squamous cell carcinoma they are easily treated with more conventional local surgical excision.

DON'T USE ZEPHIRAN!

Zephiran, Detergicide, Prep-Swab—all are aqueous quaternary ammonium antiseptics, and all permit the growth of organisms, it has been established by the Center for Disease Control, U.S. Public Health Service.

Dixon et al in J.A.M.A., Nov. 22, 1976 report that the use of such antiseptics was followed by many instances of local and blood stream infection. Prep-swabs were found to be contaminated even in the original, unopened containers. "Disinfectants may actually be the source of infections because they themselves can support the growth of certain bacterial species."

What to use as antiseptic: Iodine and alcohol are effective agents that can be used for most antiseptic purposes. Either the tincture of iodine with alcohol or as a mixture of 1 to 3% iodine in 70% ethyl or isopropyl alcohol has a broad antimicrobial spectrum with short contact times, and little likelihood of becoming contaminated. Also, the newer iodine iodophors may be used, thus avoiding any adverse reaction to iodine, and also may be used on mucosa.



Abstracts

prepared by

ALPH L GORRELL, M.D.

WHEN A PHYSICIAN GOES THROUGH LABOR

Most physicians, being men, know of labor and delivery only second hand and from what they read in books. Most medical authors, being men, tend to underestimate the distress and pain of delivery.

Very few doctors have undergone three labors, one fully sedated and two with little medication. Joni Magee¹ well describes the plight of the parturient: Paying great deal of attention to the mother helps the fetus because during pregnancy, attitudes arise that will color the life long relationship between mother and child.

She tells the obstetrician to act as if having a baby is a very exciting event because too many doctors tend to follow a set routine.

She also cautions that the obstetrician should explain every step in pregnancy and delivery to the patient, without waiting for the patient to ask. Explain that the nagging pain under the left rib is due to the fetus' foot and tell her that she can push it away, if she likes.

She pleads for opportunities for emotional release, even if it means crying out or screaming during labor. She asks the doctor: What is wrong with noise? Does screaming hurt the patient? Does it interfere with your carrying out your procedure? "Not unless it makes you feel guilty and nervous." She has a good point here. Doctors tend to order analgesics when the laboring woman becomes noisy, to assuage their fears rather than the patients.

At the beginning of descent of the head, the patient feels as if the hips are being pushed apart from the inside and something appears to be shoving the pubis and backbone apart, also.

"My fantasy at this point was that a four-armed traffic cop stood at an intersection signaling STOP to traffic in all directions; this is a surprising feeling but not a worrisome one if the patient is told about it, prepared for it."

She writes that when the head is on the perineum, she did have the sensation of urge to defecate but she said far more powerful was the sensation of a bowling ball, scrapes over the bladder, fills the vagina and stretches the labia until it feels as if it would explode. This is never told in prenatal classes.

After the delivery she noted hyperesthesiae. Even the physician feeling the fundus was painful, and delivery of the placenta felt like a tank going over the abdomen. This hyper-reactivity always surprises the physician, she has found.

Strangely enough, even though she is opposed to analgesics during labor, she feels very strongly that they should be given for after pains, every six hours, before the real pains begin.

Myths in medicine die hard. My gynecology text in medical school informed me that the cervix had no nerve supply that carried pain fibers. It took me some time in the clinic before I learned that cervical biopsies and coagulations are not painless. Now if a woman had written that book . . .

1. Magee, Joni: Labor, What the Doctor Learns as a Patient. The Female Patient: 1:27-31 (Dec.) 1976.

UNEXPECTED CARDIAC ARREST DURING ANESTHESIA AND "MINOR" SURGERY

Sudden, unexpected cardiac arrest occurred in a series of patients while being anesthetized and operated upon, most of whom were in good health and 40% of whom were being operated upon for minor conditions. The cause: Lack of oxygen due to respiratory failure (lack of intubation, inappropriate use of muscle relaxants, obesity, hypoventilation due to repeated doses of thiopental or narcotics). How to avoid: Routine use of precordial stethoscope, to detect both cardiac and pulmonary sounds.

Taylor, Gordon et al: Unexpected Cardiac Arrest. JAMA 236: 2756-2760 (Dec. 13) 1976.

INCREASING USE OF METRONIDAZOLE (FLAGYL) AS AN ANTIBIOTIC

Metronidazole (Flagyl) has been an established oral treatment for trichomoniasis for 16 years. In the last several years, it has been shown to be effective and with few side effects in the treatment of amebic dysentery and amebic hepatic abscess. Kane¹ states that it is highly effective against anaerobic bacteria, including those frequently isolated from hepatic abscesses. This author did demonstrate that it should not be used as a therapeutic test of the presence of amebiasis.

1. Kane, James et al: Metronidazole and Hepatic Abscess. JAMA 236:2653-2654 (Dec. 8) 1976.



ArMA Reports

THE MINUTES APPEARING IN THIS SECTION HAVE BEEN EDITED TO CONSERVE SPACE. A COMPLETE COPY OF THE MINUTES OF ANY MEETING WILL BE MAILED TO ANY MEMBER REQUESTING THEM.

HEALTH MANPOWER COMMITTEE

Meeting of the Health Manpower Committee of the Arizona Medical Association, held Wednesday, September 22, 1976, at 810 West Bethany Home Road, convened at 7:00 p.m., Louis C. Kossuth, M.D., Chairman, presiding.

ARIZONA HEALTH SERVICE CORPS

Proposal for a planning grant from Department of Health, Education & Welfare was reviewed. Dr. Nichols reported that it appears quite favorable that the planning funds will be granted to the ArMA Foundation.

HEALTH MANPOWER NEEDS

Dr. Kossuth reported briefly on determination of health manpower needs and the difficulty in assessing true need. It was determined to write the Arizona Department of Health Services urging them to address this matter, and also to develop a Health Manpower Inventory for Arizona, hopefully prior to the Sixth Annual Rural Health Conference next year.

SIXTH ANNUAL RURAL HEALTH CONFERENCE

Outline of proposed program format was presented by Drs. Nichols and Kossuth. Also discussed was financial support for the conference. In previous years it has been financed by the University and the Regional Medical Programs, with some support from other sources, including a grant from the University of Utah. A registration fee has been charged also.

It was suggested that support be sought from Health Systems Agencies and from ArMA, as well as the College of Medicine and the College of Agriculture at the University of Arizona.

IT WAS MOVED AND CARRIED THAT THE HEALTH MANPOWER COMMITTEE RECOMMEND THAT THE ARIZONA MEDICAL ASSOCIATION SPONSOR THE SIXTH ANNUAL ARIZONA HEALTH CONFERENCE.

IT WAS MOVED AND CARRIED THAT THE HEALTH MANPOWER COMMITTEE AUTHORIZE THE EXPENDITURE OF UP TO \$1,500.00 OF BUDGETED COMMITTEE FUNDS FOR THE SUPPORT OF THE SIXTH ANNUAL ARIZONA RURAL HEALTH CONFERENCE, AND THAT THE PRESIDENT OF ArMA BE ASKED TO SOLICIT FUNDS FROM OTHER INTERESTED PARTIES AS DISCUSSED IN THIS MEETING.

PHYSICIAN EXTENDERS

It was pointed out by Dr. Kossuth that malpractice insurance companies are looking into personnel such as Physician's Assistants and Nurses in the Extended Role with a view to surcharging physicians employing such

personnel. Further discussion is urged with the Pharmacy Board, the Board of Nursing and the Joint Boards for Physician's Assistants in developing legislation regulating these personnel.

EXECUTIVE COMMITTEE OF THE HOUSESTAFF SECTION

Meeting of the Executive Committee of the Housestaff Section, held Saturday, October 9, 1976, at 810 West Bethany Home Road, Phoenix, convened at 11:00 a.m., H. G. Butler, M.D., Chairman, presiding.

IMPAIRED PHYSICIANS

Corky Butler introduced the subject of problems of dealing with a housestaff member with drug, alcohol or other emotionally disturbed problems. The Physician Rehabilitation Committee of ArMA was discussed.

IT WAS MOVED AND CARRIED TO ASK FOR A RESIDENT MEMBER ON THE PHYSICIAN REHABILITATION COMMITTEE OF ArMA, AS WELL AS POSSIBLE CONSIDERATION OF A MEMBER WHO IS A DIRECTOR OF MEDICAL EDUCATION.

It was suggested that AMSA representatives be approached to determine if they have any mechanism for helping the emotionally disturbed student.

HOUSESTAFF BROCHURE

Proposed copy for the housestaff brochure was reviewed and a number of changes suggested. The revised copy will be sent to the Public Relations Consultant for further refining, and for layout suggestions.

1977 ANNUAL MEETING

Date of Saturday, April 23, 1977, was selected for the annual meeting of the Section.

It was suggested that a possible program might be to invite Dan Asimus, Chairman of the PNHA, and Gaylord Nordine, Chairman of the IRBS to be guest speakers.

A possible meeting format suggested is a late afternoon business meeting, with cocktails and dinner and after-dinner speakers.

It was suggested that wives be invited, and plans be made for pooling transportation from Tucson.

EXECUTIVE COMMITTEE

The meeting of the Executive Committee of the Arizona Medical Association, Inc. held at 810 West Bethany Home Road, Phoenix, Arizona on Friday, November 19, 1976 convened at 6:39 p.m., Edward Sattenspiel, M.D., president and chairman, presiding.

"HIGH RISK DIVORCE"

The resolution submitted to the Board of Directors by the Mohave County Medical Society on October 2, 1976 which reads as follows:

"WHEREAS, The divorce rate in Arizona is the second highest nationally in 1975; and

WHEREAS, The divorce rate jumped 52% in Maricopa County and 67% in Pima County between 1970 and 1975. Yavapai County had a 105% increase in filings and Mohave County had the highest increase, with a 149% jump; and

WHEREAS, Gov. Raul Castro has establish-

ed a task force for the preservation of marriage and family, headed by Pima County Conciliation Court Judge Norman S. Fenton; and

WHEREAS, Physicians are intimately connected with problems of the family, which may eventually lead to divorce; therefore be it

RESOLVED, That an Ad Hoc committee be appointed by the President of ArMA to aid the Governor's Task Force; and be it further

RESOLVED, That this Committee have representation from the various counties in the State of Arizona to present their individual problems and plans for the future."

and which was referred to the Executive Committee was discussed in detail.

IT WAS MOVED AND CARRIED TO INQUIRE OF JUDGE NORMAN S. FENTON IF THIS ASSOCIATION COULD BE OF ASSISTANCE TO HIS TASK FORCE'S EFFORTS.

PUBLICATION OF EXEMPTIONS FROM PAYING DUES AND ASSESSMENTS

Mr. Robinson reported that a complaint had been received as a result of publishing minutes of meetings in which exemptions from payment of dues and exemptions appeared. That this procedure had caused embarrassment for one of the members.

IT WAS MOVED AND CARRIED TO DELETE FROM THE MINUTES OF THE BOARD OF DIRECTORS, AND OTHER COMMITTEES, REFERENCE TO ACTIONS WHICH PROVIDE EXEMPTIONS TO PAYMENT OF DUES AND ASSESSMENTS BEFORE THOSE MINUTES ARE PUBLISHED IN *ARIZONA MEDICINE*.

MALPRACTICE ASSESSMENT

Status Report as of 11/12/76

Mr. Robinson reported that as of November 12, 1976, a total of \$187,370.00 had been collected from the 1976 Malpractice Assessment as follows:

County	Total Billed	Total Paid	% of Total Billed	Other Response	Total Accounted For	% of Total Billed
APACHE	10	10	100.0		10	100
COCHISE	30	24	80.0	5	29	96
COCONINO	54	44	81.5	2	46	85
GILA	11	6	54.5	1	7	63
GRAHAM	7	6	85.7	1	7	100
GREENLEE	9	9	100.0		9	100
MARICOPA	1317	1174	89.1	43	1217	92
MOHAVE	28	23	82.1	3	26	92
NAVAJO	6	6	100.0		6	100
PIMA	564	475	84.2	24	499	88
PINAL	33	23	69.7	5	28	84
SANTA CRUZ	6	5	83.3	1	6	100
YAVAPAI	42	30	71.4	4	34	81
YUMA	48	38	79.2	4	42	87
TOTAL	2165	1873	86.5%	93	1966	90.8

TRAVEL

Mr. Robinson recommended that Mrs. Coumbe would participate in the INTRAV Black Sea/Greek Isles Air-Sea Cruise, May 9-22, 1977 — APPROVED

ArMA SPONSORED HEALTH INSURANCE PROGRAM

Dr. Kahle pointed out that there is a real need for an Association sponsored health insurance program for physicians' offices who have recently experienced to 100% + Blue Cross/Blue Shield rate increase. Mr.

Robinson pointed out that it has been a practice in recent years for the Association to NOT set up programs that knowing compete with programs sponsored by the component county medical societies. I pointed out that both Maricopa and Pima County Medical Societies have sponsored Foundations for Medical Care which offer such health insurance programs for physicians.

It was determined that we should explore with the two foundations the concept of expanding their programs so that they could be made available to physicians in the other twelve counties.

William E. Crisp, M.D.

Secretary

by

Bruce E. Robinson

Executive Director

BOARD OF DIRECTORS

The meeting of the Board of Directors of the Arizona Medical Association, Inc. held at 810 West Bethany Home Road, Phoenix, Arizona on Saturday, November 20, 1976, a quorum being present, convened at 10:42 a.m., Edward Sattenspiel, M.D., president and chairman, presiding.

ArMPAC

Dr. Langston reported on the outcome of the recent election indicating that the candidates supported by ArMPAC, both Democrats and Republicans, were, with few exceptions, elected. He pointed out that legislators truly listen to people who have contributed to the campaign, that contributions do open doors.

Dr. Langston reported further on the declining membership problem and the need to return to joint billing at both major cour-

medical societies. He further recounted recent meetings between AMPAC legal counsel and local legal counsel over the issues and problems caused by the Federal Election Commission regulations which have become voluminous and very cumbersome.

BOARD OF DIRECTORS

Auxiliary Report

Mrs. George L. Hoffmann, President of the ArMA Auxiliary reported as follows:

"We have set strong goals for the 1976-Auxiliary Year . . . Communications and Reorganization for the efficient functioning

the ArMA Auxiliary. The auxiliary needs to be flexible and it is time for changes. Although we had to change our name . . . dropping the Vroman from ArMA Auxiliary . . . it is the wife of the physician who is the active working member. And the physician's wife of 1976 is not the same doctor's wife most of you knew 15 years ago. Through no fault of our own, we and the word "equality" means many things to different women. With these changes in attitudes . . . especially in the young doctor's wife arriving new into the medical community and to the wife who has returned to school or the business community . . . we find there are changing priorities. So with this background facing us this year, we sought change in the state auxiliary through some definite methods. On the business side, we brought about a name change, incorporation and have applied for non-profit status with the IRS and the Post Office.

Exchange of information has been produced through new types of meetings being held this year. Two such meetings were held recently . . . Newsletter Workshop involving county newsletter editors and a County President's Meeting held just last week.

We are beginning to identify some of the problems, and with identification we feel that we can then seek some solutions.

We have inflation problems just as you do. Our dues are unable to keep up with expenses. For instance as state officers, we all feel the need to take from our own pockets in order to assure something will be done well . . . this in addition to what has been budgeted for the year. As state president, I expect to spend several hundred dollars over my budget . . . this will come out of my own personal funds.

Our dues will be increased by only \$2.00 for next year's budget because of specific reasons, but this year, we had to reduce the Caduceus Crier to only 3 issues. And there is an obvious need for a paid executive to serve the auxiliary. The size of the organization in addition to the increasing activities, is becoming a burden that very few auxiliary members will wish to take on in future years. It is almost an impossibility to be a homemaker and to keep up with the paper work and executive duties of the president.

We will continue with our reorganization during this winter and spring. All ready we are beginning to see the benefits of decisions made to drop this committee, combine those, and reevaluate others . . . an example of the latter is the Hamer Education Loan Fund which is still being studied.

Surveys for community needs are being done in all 6 organized counties, hopefully by the end of this Auxiliary Year . . . we will know what areas need the help of the medical auxiliary. The auxiliary is the physician's most effective Public Relations system . . . we know this and hope that you know it, too."

It was recommended that the Finance Committee consider doubling the Association's contribution to the Auxiliary.

EXECUTIVE COMMITTEE

Membership Classification Changes Approved

Maricopa County Medical Society

a. Edward Bregman, M.D. — Active to Associate — Account Illness — Dues Exempt — Effective 1/1/77

b. Duke A. Dent, M.D. — Service to Active Over 70 — Account Age — Dues Exempt — Effective 1/1/77

c. Ronald S. Haines, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

d. Allan J. Lewis, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

e. Edward Roth, M.D. — Active to Active Over 70 — Account Age — Dues Exempt — Effective 1/1/77

f. James C. Wootton, M.D., — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

Pima County Medical Society

a. Olga E. Allers, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

b. William A. Collins, Jr., M.D. — Active to Associate — Account Retirement — Dues Exempt — Eff. 1/1/77

c. William L. Goodin, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

d. Darrell E. Hayhuist, M.D. — Active Over 70 to 50 Year Club — Requirements met — Dues Exempt — Effective 1/1/77

e. Foster L. McMillan, M.D. — New Member as Associate — Account Retirement — Dues Exempt — Effective 11/20/76.

f. Walter C. Rogers, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

g. William B. Steen, M.D., — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

h. Milton Semoff, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

Santa Cruz County Medical Society

a. Deward G. Moody, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

b. Charles S. Smith, M.D. — Active to Associate — Account Retirement — Dues Exempt — Effective 1/1/77

c. Juan S. Gonzalez, M.D. — Active Over 70 to 50 Year Club — Requirements met — Dues Exempt — Eff. 1/1/77

FINANCE COMMITTEE

Dr. Clymer reported on the financial statement for the period ending 10/31/76. He also pointed out that every facet of the organization has undergone the zero-based budget process in preparation for the compilation of the 1978 budget which will be presented to the Board of Directors at their next meeting on February 26, 1977.

Mr. Robinson responded to questions raised about his narrative dealing with the balance sheet.

GRIEVANCE COMMITTEE

Continuing Medical Education Requirement

In meeting October 9, 1976 the Grievance Committee of this Association reviewed recommendations of the Medical Education Committee regarding physicians who were reported as delinquent in meeting their 1974 and 1975 continuing medical education requirements to maintain membership in this Association and submitted a list of those who have not complied.

IT WAS MOVED AND CARRIED THAT THE FOLLOWING PHYSICIANS WHO

HAVE NOT COMPLETED THEIR CME REQUIREMENTS AND WHO HAVE NOT RESPONDED TO CORRESPONDENCE BE DROPPED FROM MEMBERSHIP AS OF 12/31/76:

Thomas E. Cosmas, M.D.
Benjamin T. Edwards, M.D.
William H. Lawson, M.D.
William W. McKinley, Jr., M.D.
Phillip E. Rice, M.D.
C. Jack Snider, M.D.
George H. Yard, M.D.

Reporting to BOMEX

Considerable discussion ensued over the problem of reporting or not reporting the above to the Board of Medical Examiners.

IT WAS MOVED AND CARRIED TO REPORT TO THE BOARD OF MEDICAL EXAMINERS ALL ARMA MEMBERS WHO HAVE COMPLETED THEIR 1974 AND 1975 CME REQUIREMENT TO MAINTAIN MEMBERSHIP IN ARMA.

Mary M. Fairbanks vs. George B. Ely, M.D.

Dr. Scott reviewed the details of the above case and reported the recommendation of the Grievance Committee to the Board.

IT WAS MOVED AND CARRIED THAT IN THE APPEALED CASE OF MARY M. FAIRBANKS VS. GEORGE B. ELY, M.D., THE DEFENDANT (GEORGE B. ELY, M.D.) IS INNOCENT OF THE CHARGE AND THAT NO FURTHER ACTION BE TAKEN.

HEALTH MANPOWER COMMITTEE

Sixth Annual Arizona Rural Health Conference

IT WAS MOVED AND CARRIED TO SPONSOR THE SIXTH ANNUAL ARIZONA RURAL HEALTH CONFERENCE AND TO AUTHORIZE UP TO \$1,500.00 OF BUDGETED COMMITTEE FUNDS TO SUPPORT THE CONFERENCE AND THAT THE PRESIDENT OF ARMA BE ASKED TO SOLICIT FUNDS TO SUPPORT THE CONFERENCE.

MEDICAL EDUCATION COMMITTEE

Reporting Year Change

IT WAS MOVED AND CARRIED THAT THE REPORTING PERIOD FOR CONTINUING MEDICAL EDUCATION ACTIVITIES BE EXTENDED TO THE 31ST OF DECEMBER, THIS CHANGE TO BECOME EFFECTIVE IN 1977 AND THAT THE DUE DATE FOR SUBMISSION OF APPLICATION FOR CONTINUING MEDICAL EDUCATION CERTIFICATE BE THE FIRST OF APRIL OF THE YEAR FOLLOWING THE END OF THE REPORTING PERIOD.

MALPRACTICE INSURANCE CRISIS COMMITTEE

The president reported that suggested appointees for the Health Care Liability Insurance Study Council had been developed and the list should be made public in the near future.

OTHER BUSINESS

Arizona Health Service Corps

Dr. Kahle, a member of the newly appointed Executive Committee of the AHSC reviewed the background of the program and announced the

receipt of the HEW cost reimbursement contract in the amount of \$101,349.00.

He pointed out that office space would be needed for this 12 month contract period and that the AHSC Executive Committee felt very strongly that the office space should be located in the ArMA headquarters building.

Mr. Robinson reported that it has been

estimated that it would cost up to \$10,850.00 to complete the required space. He also stated that the contract provided for \$4,000.00 for rent.

IT WAS MOVED AND CARRIED TO APPROVE UP TO \$10,850.00 FOR THE PURPOSE OF COMPLETING OFFICE SPACE ON THE FIRST FLOOR OF THE ASSOCIATION'S BUILDING FOR THE

PURPOSE OF RENTING IT TO THE AHSC.

William E. Crisp, M.D.

Secretary

by

Bruce E. Robinson

Executive Director



ArMA
Medical History

SOUTHSIDE DISTRICT HOSPITAL

Almost 40 years of hospital service have passed into the dusty files of history since C. M. Gerrard made those two long hand entries in a bulky old records ledger. A modern space age accounting system no longer concerns itself with the purchase of hay (the cow has long

since gone to her bovine reward) the payroll entires, however, have continued unbroken, month after month, year after year, and the monthly salary figure has grown from \$335.00 in September of 1923 to \$79,000.00 for September 1961.

If history were to reflect only the hard facts of growth patterns, this article to all intents and purposes, could end here, and the story of Southside District Hospital would have been told. But statistical facts, however interesting, are at best impersonal, cold and heartless, and leave little room for the pages of Southside Hospital's history which literally glows with records of self sacrifice, courage and determination.

To pinpoint an exact date to mark the actual beginning is virtually impossible; however, early accounts do reveal that during the stormy period following World War I several attempts to formulate a Mesa hospital failed. But the need for a hospital facility persisted and so did the determination of community minded Mesa citizens who in 1921, negotiated for the old

LeSueur home on the site of the present hospital plant and launched a drive to raise \$125,000.00 for a hospital.

The period that followed was wrought with all manner of heartbreaking reverses that might well have defeated people of lesser faith and weaker determination. But an idea born of the spirit to serve was not to be denied and with the help of the city council, the Mesa Woman's Club, the L.D.S. Church, Mrs. G. LeSueur and a host of enthusiastic area residents, Southside District Hospital was incorporated as a non-profit enterprise in 1923.

With the drafting of the original instrument of incorporation by Elijah Allen, Ida Arnold, C. A. Roberts, Lottie Holcomb, C. M. Gerrard and C. H. Russell, history's first chapter of Southside District Hospital was written. But the struggle was by no means over; the years that were to follow would see an almost endless parade of setbacks and reverses that would take almost to the limit the patience, courage and devotion of those hearty souls whose dream of a hospital for Mesa was to remain undaunted.



Original home of Southside District Hospital, photo taken 1923.



Row 1 — 1. Luella Cooper, R.N. 2. Unidentified 3. Agatha Spessard, R.N. 4. Mrs. Williamson, R.N. 5. Mrs. Lois Hansen, R.N. and Superintendent 6. Unidentified 7. Unidentified 8. Mrs. McLeod, R.N. 9. Josephene Morris, R.N. 10. Mrs. Brown, R.N. Row 2 — 11. Mrs. Louise Lind, Board member, Tempe 12. Mary Hollingshead, LPN (retired from Desert Samaritan 1974) 13. Unidentified 14. Unidentified 15. Mrs. Cheek, kitchen staff 16. Mrs. Illing, kitchen staff 17. Mrs. Altman, kitchen staff 18. Unidentified 19. Mrs. Gertrude Deshler, house-keeper 20. Mrs. Eva (Watson) Quist, R.N. 21. Ruth Wallace 22. Mrs. Stark Row 3 — 23. Mrs. Curtiss, Board member, Gilbert 24. Mr. West, maintenance 25. Lyle North, Board member, Mesa 26. Frank Gurley, Board member, Mesa 27. Dr. M. L. Kent, Mesa 28. Unidentified 29. Dr. George C. Truman, Mesa 30. Dr. Ernest Pohle, Tempe 31. Dr. Lawrence Pohle, Chandler 32. Dr. J. M. Meason, Chandler 33. Dr. Sharp, Mesa 34. Mr. Brimhall 35. Floyd Kiel. Row 4 — 36. W. H. Passey, Board member, Mesa 37. Charles A. Mitten, Board member, Mesa 38. Dr. Pete Scherr, Mesa 39. Dr. B. L. Neff, Mesa 40. L. Irwin Stapley, Board member, Mesa.



Original home of Southside District Hospital photo taken about 1930.



Desert Samaritan Hospital looking West from Dobson Road, photo taken 1975.

The story that is Southside District Hospital will be written and re-written again and again from personal experience, casual observation or careful research. But no account will ever fully report the record of courage, devotion and hard work that comprise the foundation on which the present Hospital stands. The old files and early records of the Hospital attest to the humanitarian work and dedication of those people we must forever recognize as the pioneers of Hospital service in Mesa. Mrs. Lois Hansen the first superintendent who devoted the best years of her life cooking, scrubbing, bookkeeping, collecting, bartering for food and supplies—and scores of other names that played out the drama of early Hospital life—Mitten, Ellsworth — Moeur — Greer — Dobson — LeSueur — Shouse — Holcomb — Arnold and many more.

In 1933 at the suggestion of Dr. B. B. Moeur, Governor of Arizona, an application for funds to build a new hospital was initiated, with the original paper work being handled by a patient in the hospital. Three years, and much hard work later, with city, hospital and government money, the initial building of a three point building project was completed.

With the construction of Williams Air Force Base, the need for greater Hospital facilities in the area was markedly increased, and in 1941 a \$104,000 project was developed to build the center East Wing and extend the North and

South Wings. Construction, remodeling and improvements have continued almost unbroken through the years: in 1948 the O.B. addition was completed — In 1955 the present business and administrative offices were enlarged — 1957 saw the addition of a \$100,000 21 bed wing — and finally the largest building program in the Hospital's history; the \$650,000 three story North Wing.

The history of Southside District Hospital represents more than forty years of continuous service to residents of this area — more than forty years in the performance of a duty that has forged for countless people a better, healthier life.

The Board meeting minutes no longer contain instruction to buy wood from the Indians, or hay for the cow; things are different now; but the dedication to serve, the quality that built Southside District Hospital, remains unchanged.

The largest building project in the Hospital's history was the North Wing, completed in 1958 at a cost of \$650,000. Less than half of the cost of the modern building and equipment was financed through funds acquired from the Federal Government, the Ford Foundation and many civic-minded area residents. More than \$300,000 of the total cost was paid by the hospital.

The three story North Wing incorporates a full compliment of the newest and finest facilities for efficient patient care. A ten bed Recovery Room on the third floor is equipped with piped oxygen, suction, blood pressure units and a complete series of supplemental equipment employed for the patient's welfare. Four complete surgeries are also located on the third floor.

Modern accommodations for 30 patients comprise the entire area of the spacious second floor.

Located on the first floor of the North Wing is a function group of important Hospital services that are vital to staff convenience and patient well being. Included in these facilities is a large well equipped laboratory manned by a full time Pathologist and a staff of registered technicians. This section of the Hospital contains the Emergency Department, designed and equipped to handle four emergencies at one time, plus four stand-by beds that can be pressed into service in case of extreme need.

The remainder of the North Wing's ground floor is devoted to the Fracture Room, Central Supply Equipment Services, receptionist and comfortable waiting rooms. The North Wing stands as a monument to those people who perpetually strive to maintain for the people of this area the finest, most modern Hospital service.

100 mg

250 mg

500 mg



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When Big Ben looks "a little off"...

Antivert[®]/25 (meclizine HCl) 25 mg. Tablets for vertigo*

■ **Most Widely Prescribed**—Antivert is the most widely prescribed agent for the management of vertigo* associated with diseases affecting the vestibular system such as Menière's disease, labyrinthitis, and vestibular neuronitis.

■ **Relief of Nausea and Vomiting**—Antivert/25 can relieve the nausea and vomiting often associated with vertigo*.

■ **Dosage for Vertigo***—The usual adult dosage for Antivert/25 is one tablet t.i.d.

BRIEF SUMMARY OF PRESCRIBING INFORMATION

***INDICATIONS.** Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

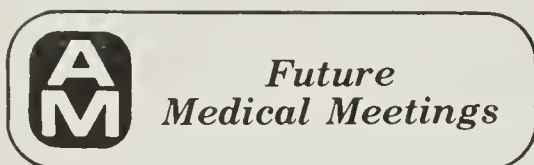
Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

More detailed professional information available on request.

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Future Medical Meetings

CONTINUING MEDICAL EDUCATION

THE FOLLOWING INSTITUTIONS AND ORGANIZATIONS HAVE RECEIVED ArMA ACCREDITATION FOR CONTINUING MEDICAL EDUCATION.

ARIZONA STATE HOSPITAL, PHOENIX
DESERT SAMARITAN HOSPITAL, MESA
GOOD SAMARITAN HOSPITAL, PHOENIX
HEALTH MAINTENANCE ASSOCIATES
PHOENIX INDIAN MEDICAL CENTER
MARICOPA COUNTY GENERAL HOSPITAL, PHOENIX
MEMORIAL HOSPITAL, PHOENIX
ST. LUKE'S HOSPITAL AND MEDICAL CENTER, PHOENIX
ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER, PHOENIX
TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM, TUCSON
VETERANS ADMINISTRATION CENTER, PRESCOTT
VETERANS ADMINISTRATION, PHOENIX

CONTINUING MEDICAL EDUCATION ACTIVITIES SPONSORED BY THESE INSTITUTIONS RECEIVE CATEGORY 1 CREDIT FOR THE ArMA CERTIFICATE IN CONTINUING MEDICAL EDUCATION AND THE AMA PHYSICIAN'S RECOGNITION AWARD.

MARCH

INTERNATIONAL CONFERENCE ON THE ADJUVANT THERAPY OF CANCER

March 2-5, 1977, Doubletree Inn, Tucson, AZ. Sponsor: U of A College of Medicine. Contact: Stephen Jones, M.D. or Sydney Salmon, M.D., U of A College of Medicine. Approved for 22 required hours toward the ArMA Certificate in Continuing Medical Education.

ARIZONA SOCIETY OF OTOLARYNGOLOGY & MAXILLO-FACIAL SURGERY

March 4-5, 1977, Camelback Inn, Scottsdale, AZ. Sponsor: Arizona Society of Otolaryngology & Maxillo-Facial Surgery. Contact: Floyd K. Berk, M.D., P.O. Box 27466, Tucson, AZ 85726. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CONTEMPORARY MANAGEMENT OF ACUTE MYCARDIAL INFARCTION BY THE FAMILY PHYSICIAN

March 17-19, 1977, Adams Hotel, Phoenix, AZ. Sponsor: American College of Cardiology & American Academy of Family Physicians. Contact: Mary Anne McNerny, American College of Cardiology, 9650 Rockville Pike, Bethesda, MD 20014.

MEDICAL EDUCATION LECTURE

March 8, 1977, Conference Rm. Glendale Samaritan Hospital. Sponsor: Glendale Samaritan Hospital. Contact: Robert Easley, M.D., 7800 N. 59th Ave., Glendale, AZ 85031. Approved for 1 required hour toward the ArMA Certificate in Continuing Medical Education.

DAY OF NEPHROLOGY

March 11, 1977, Camelback Inn, Scottsdale, AZ. Sponsor: St. Joseph's Hospital & Medical Center, Dept. of IM. Contact: Ethelann Murray, M.D., St. Joseph's Hospital and Medical Center, 350 W. Thomas Rd., Phoenix, AZ 85013. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CLINICAL RECOGNITION AND MANAGEMENT OF HEART DISEASE

March 17-19, Arizona Health Sciences Center, Tucson, AZ. Sponsor: U of A College of Medicine. Contact: Frank I. Marcus, M.D., Arizona Health Sciences Center, Tucson, AZ 85724. Approved for 20 required hours toward the ArMA Certificate in Continuing Medical Education.

AMERICAN ASSOC. OF MEDICAL ASSISTANTS ANNUAL STATE EDUCATION SEMINAR PREMATURITY, NUMBER ONE KILLER OF BABIES

March 19, 1977, Sunset Hills and Bronze Saddle Restaurant, Prescott, AZ. Sponsor: American Assoc. of Medical Assistants, State of Arizona. Contact: Ms. Kathleen Schultz, CMA-A 213 W. Silver Spruce, Flagstaff, AZ 86001.

SELECTED TOPICS IN LIVER DISEASE FOR CLINICIANS

March 18-19, 1977, Scottsdale Hilton Inn Resort, Scottsdale, AZ. Sponsor: Maricopa County General Hospital Dept. of Medicine. Contact: Harry F. Lenhardt, M.D., Maricopa County General Hospital, 2601 E. Roosevelt, Phoenix, AZ 85008. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

EMERGENCY MEDICINE: CLINICAL-RADIOLOGICAL CORRELATION

March 18-20, 1977, Pointe West Resort, Phoenix, AZ. Sponsor: Maricopa County General Hospital. Contact: Austin R. Sandrock, M.D., Chairman, Dept. of Radiology, Maricopa County General Hospital, 2601 E. Roosevelt, Phoenix, AZ 85008.

INFANT NUTRITION: A FOUNDATION FOR LAST HEALTH?

March 23, 1977 Closed-circuit three hour live televised symposium which will be broadcast to physicians in 19 cities Arizona's closest city in Los Angeles. Sponsor: U of Iowa College of Med. National Heart, Lung & Blood Inst. National Kidney Foundation, Comt. on Atherosclerosis & Hypertension in Childhood, Council on Cardiovascular Disease in the Young of the Amer. Heart Assoc. Contact: Pat Coleine, Health Learning Systems Inc., c/o Health Projects International Inc., 200 Madison Ave., New York, New York 10016. CME hours available.

UPDATE: PRIMARY CARE 1977

March 23-26, 1977, Arizona Health Sciences Center, 15011 N. Campbell, Tucson, AZ. Sponsor: U of A College of Medicine Office of CME. Contact: George D. Commerci, M.D., U of A College of Medicine Tucson, AZ 85724. Approved for 22 required hours toward the ArMA Certificate in Continuing Medical Education.

13TH ANNUAL ARIZONA CHEST SYMPOSIUM

March 25-27, 1977, Doubletree Inn, Tucson, AZ. Sponsor: U of A College of Medicine Div. of Respiratory Section. Contact: Charles W. Otto, M.D., U of A College of Medicine, Tucson, AZ 85724. Approved for 20 required hours toward the ArMA Certificate in Continuing Medical Education.

DIAGNOSIS & TREATMENT OF CANCER — LATEST CLINICAL ADVANCES

March 25-26, 1977, Hyatt Regency Hotel Phoenix, AZ. Sponsor: St. Joseph's Hospital & Medical Center. Contact: Kent J. Rossman, M.D., 350 W. Thomas Rd. Phoenix, AZ 85013. Approved for 10 required hours toward the ArMA Certificate in Continuing Medical Education.

INTERNATIONAL CARDIOVASCULAR CONGRESS I NON-INVASIVE DIAGNOSIS

March 28-30, 1977, Scottsdale Center for the Arts, Scottsdale, AZ. Sponsor: Arizona Heart Institute. Contact: Edward B. Diethrich, M.D., 3800 N. Central, Phoenix, AZ 85012. Approved for 17 required hours toward the ArMA Certificate in Continuing Medical Education.

RAVEL STUDY WORKSHOP- FAMILY* COMMUNITY MEDICINE

March 28-April 4, 1977. Acapulco Pariso, Marriott Hotel, Acapulco, Mexico. Sponsor: Dept. of Family and Comm. Medicine, U of A. College of Med. Contact: Anthony F. Futuro, M.D., Dept. of Family & Comm. Medicine, College of Med., U of A, Tucson, AZ 85724. Approved for 28 required hours toward the ArMA Certificate in Continuing Medical Education.

APRIL

CLINICAL CYTOPATHOLOGY FOR PATHOLOGISTS — POSTGRADUATE COURSE

April 11-22, 1977, Johns Hopkins Univ. School of Medicine. Johns Hopkins Univ. School of Medicine. Sponsor: Johns Hopkins Univ. School of Medicine & Johns Hopkins Hospital. Contact: John K. Frost, M.D., 610 Pathology Bldg., The Johns Hopkins Hospital, Baltimore, Maryland 21205. Before 2/28/77. Approved for 120 required hours toward the ArMA Certificate in Continuing Medical Education.

29TH ANNUAL MEETING OF SOUTHWESTERN SURGICAL CONGRESS

April 25-28, 1977, Acapulco, Mexico. Sponsor: Southwestern Surgical Congress. Contact: Jack A. Barney, M.D., Secy-Treas. The Southwestern Surgical Congress, 708 Physicians & Surgeons Bldg., Oklahoma City, OK 73103.

2ND ANNUAL CONFERENCE NEONATAL-PERINATAL MEDICINE

April 21-23, 1977, Scottsdale Hilton Hotel, Scottsdale, AZ. Sponsor: Dist. VIII American College of Obstetricians & Gynecologists & Dist. VIII Nurses' Assoc. of Amer. College of Obstetricians and Gynecologists. Contact: L. Joseph Butterfield, M.D., Chairman, Perinatal Pediatrics Section Dist. VII, American Academy of Pediatrics, 1056 East Nineteenth Ave., Denver, CO 80218.

36TH ANNUAL MEETING OF THE ARIZONA MEDICAL ASSOCIATION

April 28-29, 1977. Hyatt Regency Hotel, Phoenix, AZ. Sponsor: Scientific Assemb. Committee of ArMA. Contact: Luis Tan, M.D., Chairman, Scientific Assembly Committee, Arizona Medical Assoc., 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 14 1/2 required hours toward the ArMA Certificate in Continuing Medical Education.

MONTHLY OR WEEKLY

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Society. Contact: Mrs. Mary Wood, 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 2 required hours per session toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tucson Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine & Dept. of IM, Dermatology Sect. Contact: Peter Lynch, M.D., U of A College of Medicine, Tucson, AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U of A College of Medicine, Dept. of Internal Medicine, Clinical Immunology Section. Contact: John Boyer, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd & 5th Thursday — Rm. N318, VA Hospital, 2nd & 4th Thursday, Rm. 6505, Tucson Medical Center. Sponsor: U of A College of Medicine, Department of Internal Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th Tuesdays — Rm. 6505, AZ Medical Center. 2nd & 4th Tuesdays — Rm. N318, Veterans Adm. Hospital. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Sidney Salmon, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

GRAND WARD ROUNDS — TRAUMA

Every Tuesday, 8 a.m. Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Surgery Dept., Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room 4410, Arizona Medical Center Tucson, AZ. Sponsor: Division of Ophthalmology, U of A College of Medicine. Contact: H. E. Cross, M.D., Ph.D., Arizona Medical Center, Dept. of Surgery, Tucson, AZ. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd, & 5th Wednesday — Staff Conf. Rm., VA Hospital. 2nd & 4th Wednesday — Rm 5403, Arizona Medical Center. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Jay Smith, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm. 8403, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine Dept. of Psychiatry. Contact: Alan Levenson, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 1/2 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Dept. of Surgery, Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State Hospital, Phoenix, AZ. Sponsor: Arizona State Hospital. Contact: Howard E. Wulsin, M.D., Arizona State Hospital, 2500 E. Van Buren, Phoenix, AZ 85008. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

SURGICAL GRAND ROUNDS 4TH TUESDAY OF EACH MONTH

Hospital Auditorium, Baptist Hospital, Phoenix. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 6036 N. 19th Ave., Phoenix, AZ 85015. Approved for 1 1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE

Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CAMELBACK HOSPITAL CLINICAL CONFERENCE

3rd Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

COUNTER TRANSFERENCE GROUP
Weekly, Thurs. 8-10 p.m. Sponsor: Phoenix Psychiatric Council. Contact: James E. Campbell, M.D., 5051 N. 34th St., Phoenix, AZ 85018. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DESERT SAMARITAN HOSPITAL

Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Rosati, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS

Mondays — 12 Noon. D-5 North Conference Rm., Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE

3rd Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 926 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

BI-MONTHLY MEDICAL EDUCATION SEMINAR

Every other Wed. AM Begin 7/3/74. Maryvale Samaritan Hospital, Phoenix, AZ. Sponsor: Medical Staff Maryvale Hospital. Contact: Thomas J. Groves, M.D., 6037 W. Elm St., Phoenix, AZ 85033. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Third Monday of the Month, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 1201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS

Last Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U of A Medical Center, Dept. of Radiology. Contact: Irwin M. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE

1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MORBIDITY & MORTALITY CONFERENCE

2nd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CLINICAL PATHOLOGICAL CONFERENCE

4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

3rd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

GRAND ROUNDS

Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Sponsor: Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Century Medical Plaza, Suite 160, 1701 West St. Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.



INTERNATIONAL CARDIOVASCULAR CONGRESS I

NON-INVASIVE DIAGNOSIS

PRESENTED BY THE ARIZONA HEART INSTITUTE
MARCH 28, 29, 30, 1977 (Monday, Tuesday, Wednesday)
Scottsdale Center for the Arts
SCOTTSDALE, ARIZONA

PURPOSE

Non-invasive techniques for the diagnosis of heart, arterial and venous diseases are rapidly becoming one of the fastest growing areas of medical science. The purpose of this International Congress I is to bring together leading experts from around the world to present and discuss current techniques, instrumentation and results. The Congress is planned for both formal presentation of scientific papers and motion pictures and informal discussions for the maximum benefit of the participants.

ACCREDITATION

ArMA

This program is approved for 17 Required hours toward Arizona Medical Association's Certificates in Continuing Medical Education.

AAFP

This Program is acceptable for 17 Elective hours by the American Academy of Family Physicians.

REGISTRATION

Registration is open to physicians in all fields of medicine interested in non-invasive cardiovascular diagnosis. Internists, cardiologists, cardiac and vascular surgeons, family physicians, and other specialty groups will benefit from this international symposium on the state of art.

FEES

Registration is \$150, which includes lunches.

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Scientific session will include discussion on the use of Doppler, Stress Testing, Oculoplethysmography, Carotid Phonoangiography, Impedance Plethysmography, Vectorcardiography, Ultrasound Scanning, and other non-invasive diagnostic techniques.

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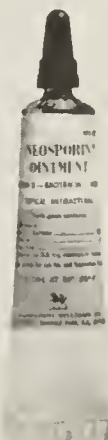
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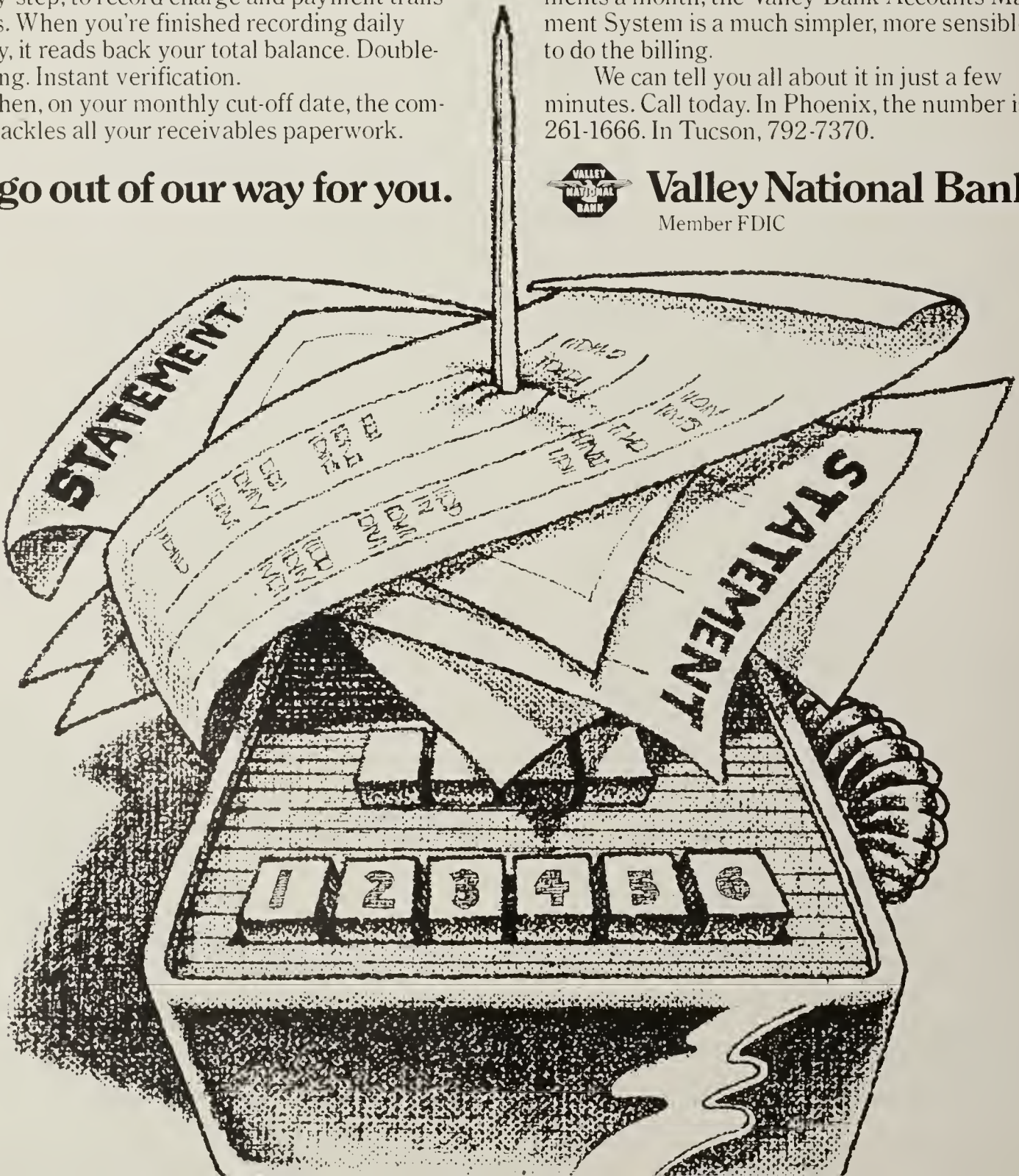
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A brief summary of the Prescribing Information for
Lasix® (furosemide) Tablets 20 mg and 40 mg

WARNING—Lasix (furosemide) is a potent diuretic which if given in excessive amounts can lead to a profound diuresis with water and electrolyte depletion. Therefore, careful medical supervision is required, and dose and dose schedule have to be adjusted to the individual patient's needs. (See under "Dosage and Administration.")

Indications—Lasix (furosemide) is indicated for the treatment of the edema associated with congestive heart failure, cirrhosis of the liver, and renal disease, including the nephrotic syndrome.

Hypertension—Lasix (furosemide) may be used for the treatment of hypertension alone or in combination with other antihypertensive drugs. Hypertensive patients who cannot be adequately controlled with thiazides will probably also not be adequately controllable with Lasix (furosemide) alone.

CONTRAINDICATIONS—Because animal reproductive studies have shown that Lasix (furosemide) may cause fetal abnormalities, the drug is contraindicated in women of childbearing potential. (See "Additional Information.")

Lasix (furosemide) is contraindicated in anuria. If increasing azotemia and oliguria occur during treatment of severe progressive renal disease, the drug should be discontinued. In hepatic coma and in states of electrolyte depletion, therapy should not be instituted until the basic condition is improved or corrected. Lasix (furosemide) is contraindicated in patients with a history of hypersensitivity to this compound.

Warnings—Excessive diuresis may result in dehydration and reduction in blood volume, with circulatory collapse and with the possibility of vascular thrombosis and embolism, particularly in elderly patients. Excessive loss of potassium in patients receiving digitalis glycosides may precipitate digitalis toxicity. Care should also be exercised in patients receiving potassium depleting steroids.

Frequent serum electrolyte, CO₂ and BUN determinations should be performed during the first few months of therapy and periodically thereafter, and abnormalities corrected or the drug temporarily withdrawn.

In patients with hepatic cirrhosis and ascites, initiation of therapy with Lasix (furosemide) is best carried out in the hospital. Sudden alterations of fluid and electrolyte balance in patients with cirrhosis may precipitate hepatic coma; therefore, strict observation is necessary during the period of diuresis. Supplemental potassium chloride and, if required, an aldosterone antagonist are helpful in preventing hypokalemia and metabolic alkalosis.

Patients should be observed regularly for the possible occurrence of blood dyscrasias, liver damage, or other idiosyncratic reactions.

In those instances where potassium supplementation is required, an oral liquid preparation should be used rather than enteric-coated potassium salts.

There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated thiazides with potassium salts. These lesions may occur with enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides, or certain other oral diuretics.

These small-bowel lesions have caused obstruction, hemorrhage, and perforation. Surgery was frequently required, and deaths have occurred.

Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneously. Therefore, coated potassium-containing formulations should be administered only when indicated and should be discontinued immediately if abdominal pain, distention, nausea, vomiting, or gastrointestinal bleeding occurs.

Patients with known sulfonamide sensitivity may show allergic reactions to Lasix (furosemide).

Precautions—As with any potent diuretic, electrolyte depletion may occur during therapy with Lasix (furosemide), especially in patients receiving higher doses and a restricted salt intake. Electrolyte depletion may manifest itself by weakness, dizziness, lethargy, leg cramps, anorexia, vomiting, and/or mental confusion.

Asymptomatic hyperuricemia can occur and gout may rarely be precipitated. Reversible elevations of BUN may be seen. These have been observed in association with dehydration, which should be avoided, particularly in patients with renal insufficiency.

When parenteral use of Lasix (furosemide) precedes its oral use, it should be kept in mind that cases of tinnitus and reversible hearing impairment have been reported. There have also been some reports of cases in which irreversible hearing impairment occurred. Usually, ototoxicity has been reported when Lasix (furosemide) was injected rapidly in patients with severe impairment of renal function at doses exceeding several times the usual recommended dose and in whom other drugs known to be ototoxic were often given. If the physician elects to use high dose parenteral therapy in patients with severely impaired renal function, controlled intravenous infusion is advisable (for adults, it has been reported that an infusion rate not exceeding 4 mg Lasix [furosemide] per minute has been used).

Increases in blood glucose, and alterations in glucose tolerance tests with abnormalities of the fasting and two-hour postprandial sugar have been observed, and rare cases of precipitation of diabetes mellitus have been reported.

Lasix (furosemide) may lower serum calcium levels, and rare cases of tetany have been reported.

Patients receiving high doses of salicylates, in conjunction with Lasix (furosemide) may experience salicylate toxicity at lower doses because of competitive renal excretory sites.

Diuretics such as furosemide may enhance the nephrotoxicity of cephaloridine. Therefore, Lasix (furosemide) and cephaloridine should not be administered simultaneously.

Sulfonamide diuretics have been reported to decrease arterial responsiveness to pressor amines and to enhance the effect of tubocurarine. Great caution should be exercised in administering curare or its deriva-

tives to patients undergoing therapy with Lasix (furosemide), and it is advisable to discontinue Lasix (furosemide) for one week prior to any elective surgery.

Adverse Reactions—Various forms of dermatitis, including urticaria and rare forms of exfoliative dermatitis, erythema multiforme, pruritus, paresthesia, blurring of vision, postural hypotension, nausea, vomiting, or diarrhea.

Anemia, leukopenia, aplastic anemia, and thrombocytopenia (with purpura). Rare cases of agranulocytosis which responded to treatment.

In addition, the following rare adverse reactions have been reported; however, relationship to the drug has not been established with certainty: sweet taste, oral and gastric burning, paradoxical swelling, headache, jaundice, thrombophlebitis and emboli and acute pancreatitis.

Lasix (furosemide)-induced diuresis may be accompanied by weakness, fatigue, lightheadedness or dizziness, muscle cramps, thirst, increased perspiration, urinary bladder spasm, and symptoms of urinary frequency.

Dosage and Administration

ADULTS

The usual adult dose of Lasix (furosemide) is 20 to 80 mg given as a single dose.

If the diuretic response with a single dose of 20 to 80 mg is not satisfactory, the following schedule should be used: Increase this dose by increments of 20 or 40 mg not sooner than 6 to 8 hours after the previous dose until the desired diuretic effect has been obtained. This individually determined single dose should then be given once or twice daily. The dose of Lasix (furosemide) may be carefully titrated up to 600 mg per day in those patients with severe clinical edematous states.

With doses exceeding 80 mg/day and given for prolonged periods, careful clinical and laboratory observations are particularly advisable.

Hypertension—The usual dose of Lasix (furosemide) is 40 mg twice daily both for initiation of therapy and for maintenance. Careful observations for changes in blood pressure must be made when this compound is used with other antihypertensive drugs, especially during initial therapy. The dosage of other agents must be reduced by at least 50 percent as soon as Lasix (furosemide) is added to the regimen to prevent excessive drop in blood pressure. As the blood pressure falls under the potentiating effect of Lasix (furosemide), a further reduction in dosage, or even discontinuation, of other antihypertensive drugs may be necessary. It is further recommended, if 40 mg twice daily does not lead to a clinically satisfactory response, to add other hypotensive agents, e.g., reserpine, rather than to increase the dose of Lasix (furosemide).

INFANTS AND CHILDREN

Pediatric Administration: The usual initial dose of oral Lasix in infants and children is 2 mg/kg body weight, given as a single dose. If the diuretic response is not satisfactory after the initial dose, dosage may be increased by 1 or 2 mg/kg not sooner than 6 to 8 hours after the previous dose. Doses greater than 6 mg/kg body weight are not recommended.

For maintenance therapy in infants and children, the dose should be adjusted to the minimum effective level.

How Supplied—Lasix Tablets 40 mg (furosemide) supplied as white, round, monogrammed, scored tablets.

Lasix Tablets 20 mg (furosemide) supplied as white, oval, monogrammed tablets.

Note: Dispense in dark containers. Exposure to light may cause slight discoloration which, however, does not alter potency.

Additional Information

Toxicology

The acute toxicity of Lasix (furosemide) has been determined in mice, rats, and dogs. In all three animal species, the oral LD₅₀ of Lasix (furosemide) exceeded 1000 mg/kg of body weight, while the intravenous LD₅₀ ranged from 300 to 680 mg/kg. Intragastric injection of the drug in newborn rats resulted in an LD₅₀ of 380 mg/kg.

The acute toxicity of high doses of Lasix (furosemide) was characterized by convulsions, paralysis, and collapse. Surviving animals often became dehydrated and depleted of electrolytes due to the diuresis induced by Lasix (furosemide). In the newborn rats, intragastric injection of the drug caused hyperactivity and anorexia.

Chronic toxicity studies with Lasix (furosemide) were done in rats and dogs. In a one-year study in rats, renal tubular degeneration occurred, with all doses higher than 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day). A six-month study in dogs revealed calcification and scarring of the renal parenchyma at all doses above 10 mg/kg (83 percent of the maximal recommended human dose of 600 mg per day).

Reproductive Studies

The effects of Lasix (furosemide) on embryonic and fetal development and on pregnant dams were studied in mice, rats, and rabbits.

Lasix (furosemide) caused unexplained maternal deaths and abortions in the rabbit when 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day) was administered between days 12 to 17 of gestation. In a previous study the lowest dose of only 25 mg/kg (2 times the maximal recommended human dose of 600 mg per day) caused maternal deaths and abortions. In a third study, none of the pregnant rabbits survived a dose of 100 mg/kg. Data from the above studies indicate fetal lethality which can precede maternal deaths.

The results of the mouse study and one of the three rabbit studies also showed an increased incidence of hydronephrosis (distention of the renal pelvis and, in some cases, of the ureters) in fetuses derived from treated dams as compared to the incidence in fetuses from the control group.



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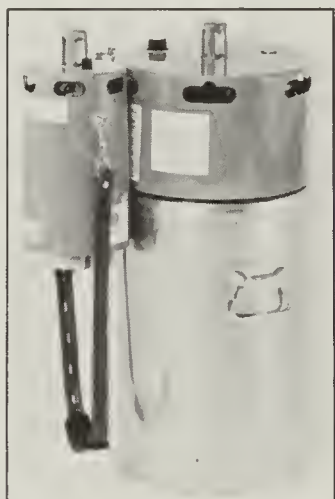
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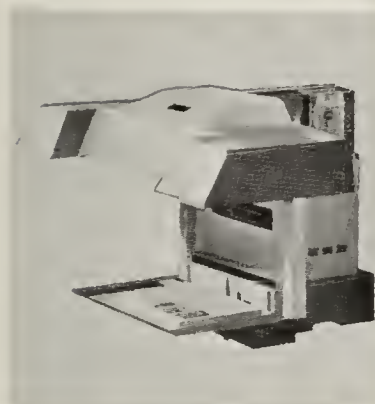
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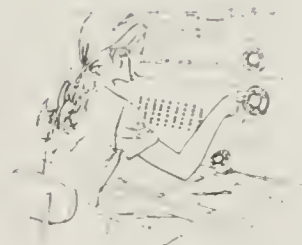
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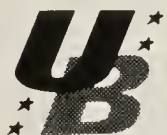
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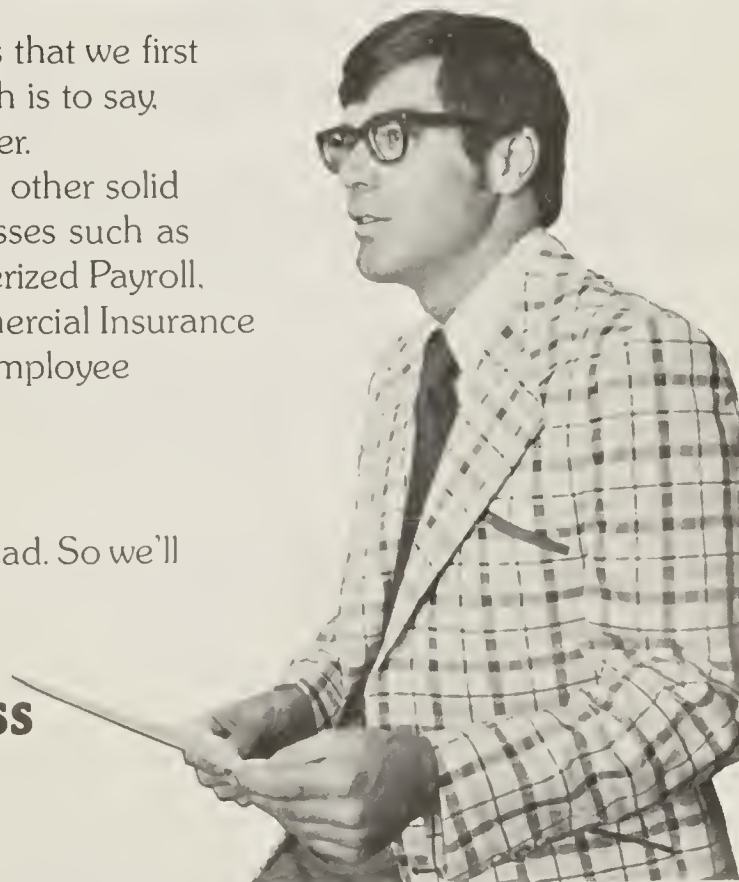


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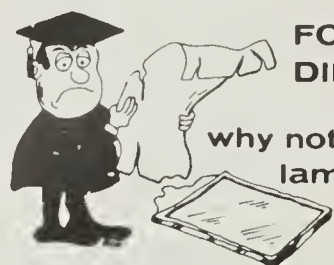
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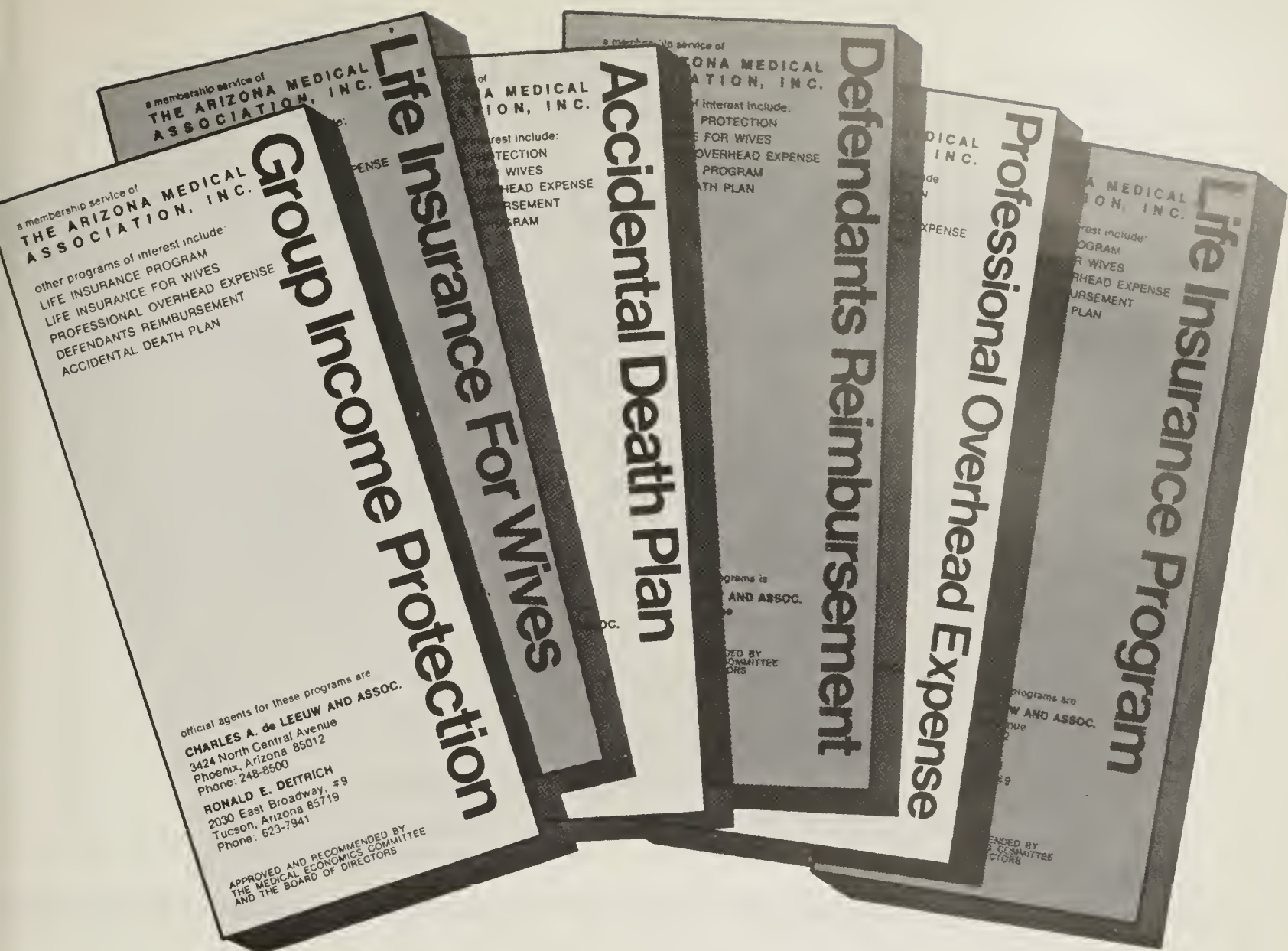
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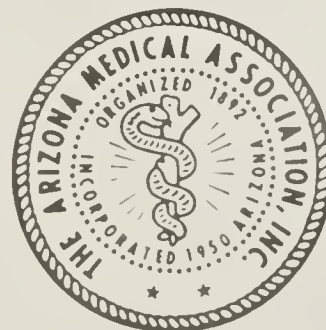


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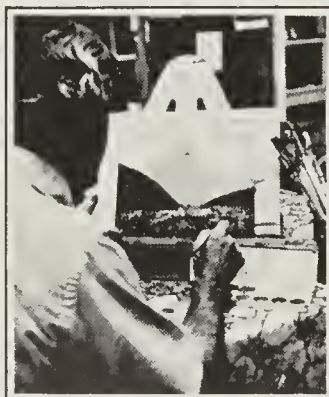
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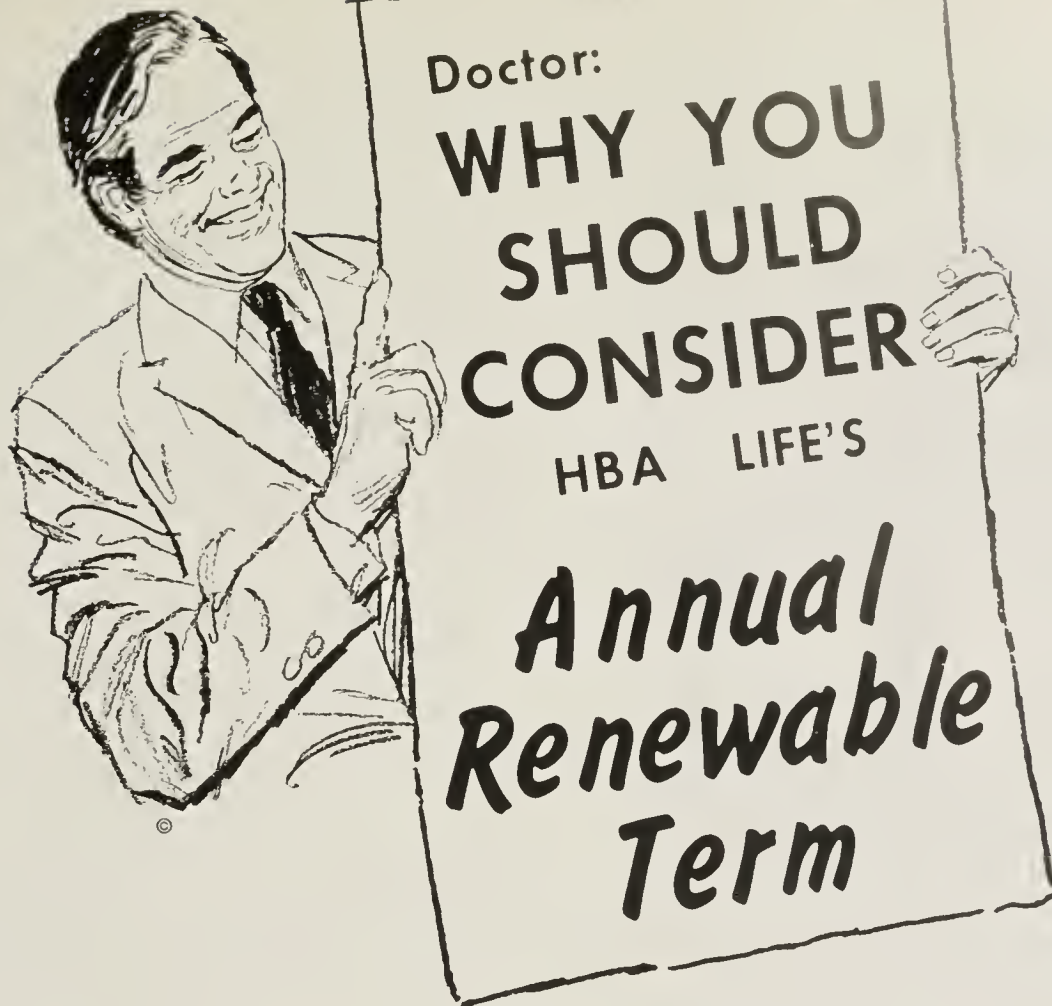
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A MESSAGE TO MY PATIENTS

Unfortunately, I find that the excessive use of alcohol is a problem with some of my patients. Alcohol abuse by itself is a hazard to health, but when combined with driving it is particularly dangerous. Today, alcohol-related highway crashes rank right after cancer and heart disease as a leading cause of death among Americans.

The first step in controlling alcohol abuse is self-awareness. I therefore urge any of my patients who are concerned about their drinking problem to discuss it with me.

Even if you don't have a drinking problem, you could be killed or injured if you drive after too much to drink. So, for your good health and safety, stop and think. Are you taking unnecessary risks by driving after excessive drinking or by riding with others who occasionally drink too much?

A MESSAGE TO MY PATIENTS

Alcohol Crashes Rank High as Killers

Today the leading causes of death are degenerative diseases usually associated with advancing age. But automobile accidents have now moved up to the point where they are challenging for the lead. Each year, 28,000 Americans die and thousands more are injured in highway accidents involving alcohol. In fact, because vehicle crashes kill and injure the young as well as old, they are equalled only by heart disease as the major single factor in lost man-years of productivity. And among persons under 35, highway crashes are the major single cause of death.

You May Not Recognize the Risk

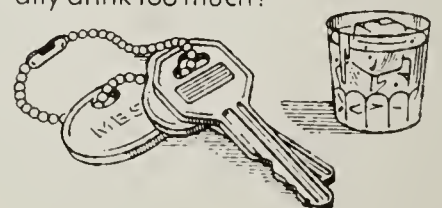
How many times have you taken too many drinks, gotten into your car and driven home? Or

driven with somebody who has been drinking too much? People who drink excessively and drive can increase their risk of a crash by 25 times or more.

Talk to Your Doctor

If the amount of your drinking is a concern to you, feel free to talk to me. Medication, counseling or therapy can be of help.

Even if you don't have a drinking problem, you could be killed or injured if you drive after too much to drink. So, for your good health and safety, stop and think. Are you taking unnecessary risks by driving after excessive drinking or by riding with others who occasionally drink too much?



**86TH ANNUAL MEETING
ARIZONA MEDICAL
ASSOCIATION
HYATT REGENCY,
PHOENIX**

TUESDAY, APRIL 26, 1977

1 P.M. HOUSE OF DELEGATES
MEETING

WEDNESDAY, APRIL 27, 1977

8 A.M. REFERENCE COMMITTEE
MEETINGS — open to all
members
12 Noon GOLF AND TENNIS
TOURNAMENTS
7 P.M. INTERNATIONAL
RECEPTION AND BUFFET
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THURSDAY, APRIL 28, 1977

7:30 A.M. "CONTINUING MEDICAL
EDUCATION" — a breakfast
panel
8 A.M. — 5 P.M. POST GRADUATE COURSE
"INFECTIOUS DISEASE"
9 A.M. — 5 P.M. 27 SCIENTIFIC PRESENTA-
TIONS FROM WHICH TO
CHOOSE (three concurrent
sessions all day long)
3:30 — 5 P.M. "UNDERSTANDING THE
TEENAGER" — panel
presentation
7 P.M. AIRPAC RECEPTION
8 P.M. AIRPAC BANQUET

FRIDAY, APRIL 30, 1977

FRIDAY, APRIL 30, 1977

7:30 A.M. "THE FINAL ILLNESS OF
PRESIDENT GEORGE
WASHINGTON" — breakfast
panel program
8 A.M. — 5 P.M. POST GRADUATE COURSE
"PAIN"
9 A.M. — 5 P.M. 25 SCIENTIFIC PRESENTA-
TIONS FROM WHICH TO
CHOOSE (three concurrent
sessions all day long)
2 P.M. — 5 P.M. "SPORTS INJURIES" — panel
presentation
7 P.M. PRESIDENT'S RECEPTION
8 P.M. PRESIDENT'S BANQUET

SATURDAY, APRIL 30, 1977

8 A.M. HOUSE OF DELEGATES
MEETING

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- three dosage strengths meet most patient needs

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Indications: Relief of anxiety and tension occurring alone or accompanying various disease states.

Contraindications: Patients with known hypersensitivity to the drug.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. As with all CNS-acting drugs, caution patients against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Though physical and psychological dependence have rarely been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions), following discontinuation of the drug and similar to those seen with barbiturates, have been reported.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psycho-

Libritabs® (chlordiazepoxide) available in 5 mg, 10 mg and 25 mg tablets.



tropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (e.g., excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relation-

ship has not been established clinically.

Adverse Reactions: Drowsiness, ataxia and confusion may occur, especially in the elderly and debilitated. These are reversible in most instances by proper dosage adjustment, but are also occasionally observed at the lower dosage ranges. In a few instances syncope has been reported. Also encountered are isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent and generally controlled with dosage reduction; changes in EEG patterns (low-voltage fast activity) may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice and hepatic dysfunction have been reported occasionally, making periodic blood counts and liver function tests advisable during protracted therapy.

Usual Daily Dosage: Individualize for maximum beneficial effects. *Oral—Adults:* Mild and moderate anxiety and tension, 5 or 10 mg *t.i.d.* or *q.i.d.*; severe states, 20 or 25 mg *t.i.d.* or *q.i.d.* *Geriatric patients:* 5 mg *b.i.d.* to *q.i.d.* (See Precautions.) **Supplied:** Librium® (chlordiazepoxide HCl) *Capsules*, 5 mg, 10 mg and 25 mg—bottles of 100 and 500; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25, and in boxes containing 10 strips of 10; Prescription Paks of 50, available singly and in trays of 10. Libritabs® (chlordiazepoxide) *Tablets*, 5 mg, 10 mg and 25 mg—bottles of 100 and 500. With respect to clinical activity, capsules and tablets are indistinguishable.



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Please see preceding page for a summary of product information.

Arizona Medicine



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But the individual character of Valium is even more apparent clinically than pharmacokinetically. And far more significant. That's because of the patient response obtained with Valium. A response which brings a calmer frame of mind. A response which has a pronounced effect on the somatic symptoms of anxiety, particularly muscular tension. A response which helps the patient feel more like himself again because of the way Valium reduces the overwhelming symptoms of anxiety and psychic tension.

Another important aspect of the clinical character of Valium is safety. Though drowsiness, ataxia and fatigue are possible, these and more serious side effects are rarely a problem. Of course, as with all CNS-acting drugs, patients taking Valium should be cautioned against driving, operating dangerous machinery or the simultaneous ingestion of alcohol.

Unquestionably, many psychotherapeutic agents, including other benzodiazepines, have antianxiety effects. But one fact remains: you get a certain kind of patient response with Valium. It's a response you want. A response you know. A response you trust as part of your overall management of anxiety and psychic tension.

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a prudent choice in psychic
tension and anxiety

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome; convulsive disorders (not for sole therapy).

Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication, abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed, drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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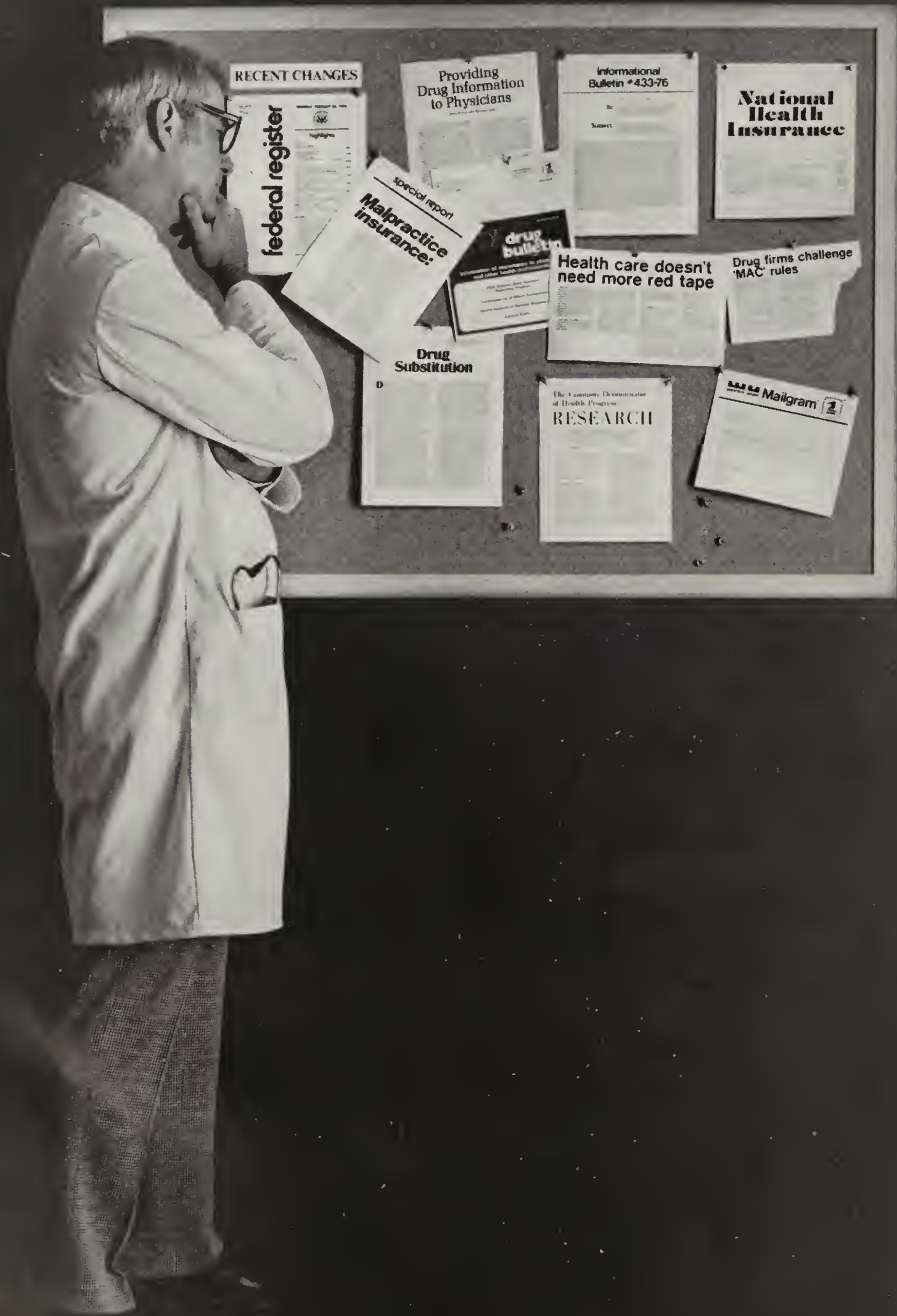
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Published monthly by The Arizona Medical
Association, Inc., with offices at 810 W.
Bethany Home Rd., Phoenix, Arizona 85013.
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RESEARCH

Mailgram 2

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

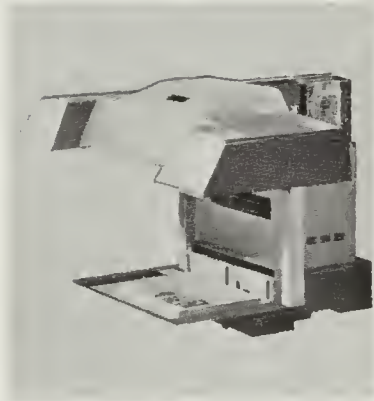
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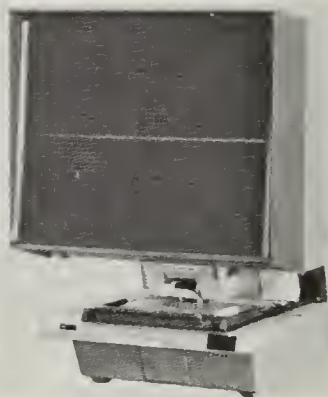
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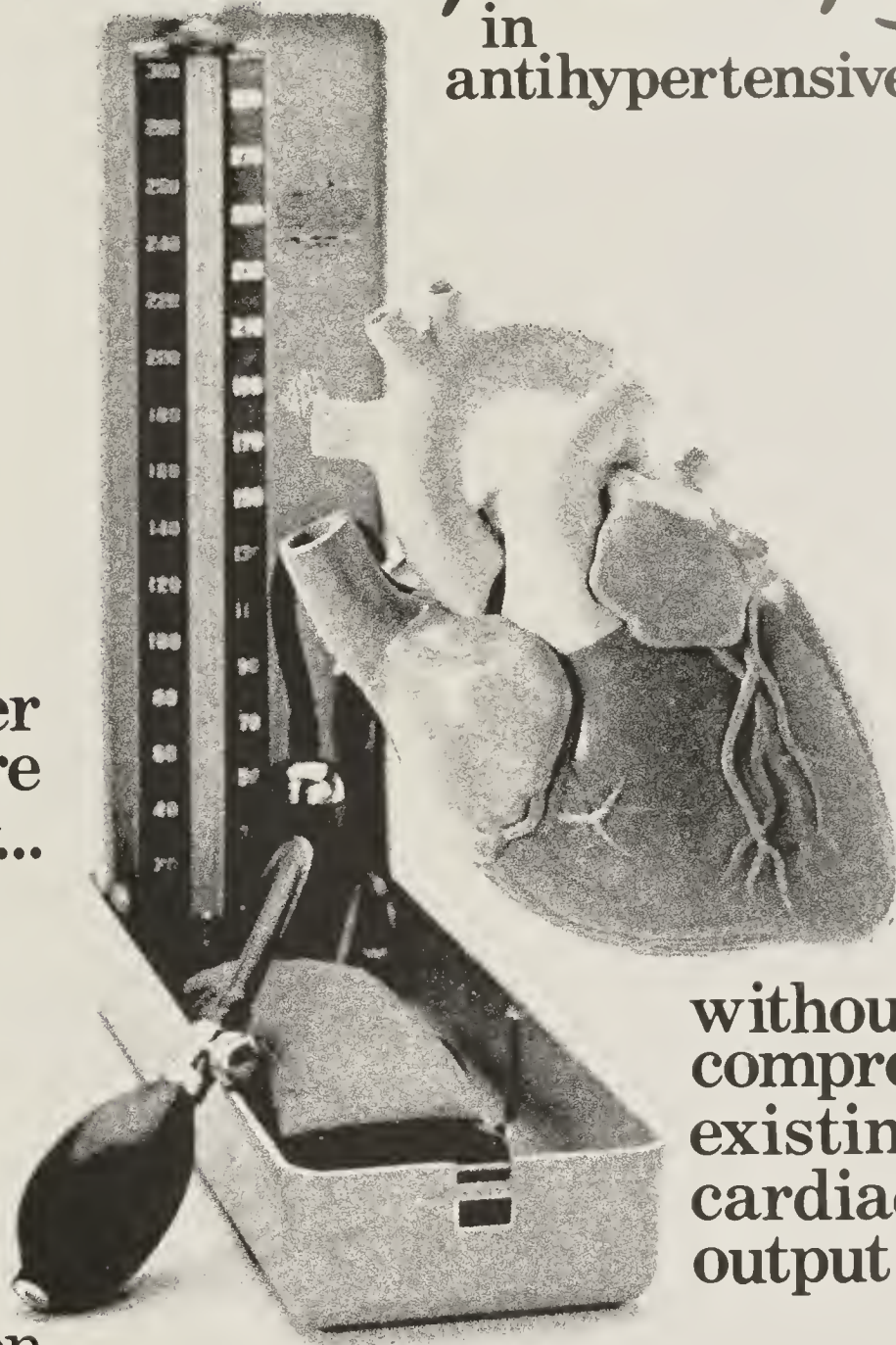
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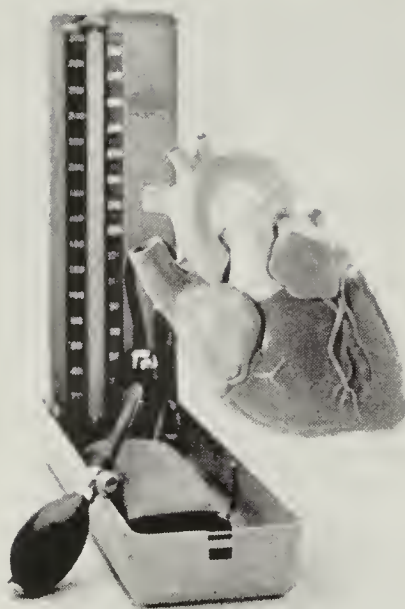
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cardiac function—cardiac output
is usually maintained

ALDOMET is contraindicated in active hepatic disease, hypersensitivity to the drug, and if previous methyldopa therapy has been associated with liver disorders. It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. For more details see the brief summary of prescribing information.

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effectively...
usually with no
direct effect on
cardiac function—
cardiac output is
usually maintained

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Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or

cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Use in Pregnancy: Use of any drug in women who are or may become pregnant requires that anticipated benefits be weighed against possible risks; possibility of fetal injury can not be excluded.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

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Adverse Reactions: *Central nervous system:* Sedation, headache, asthenia or weakness, usually early and transient; dizziness, lightheadedness, symptoms of cerebrovascular insufficiency, paresthesias, parkinsonism, Bell's palsy, decreased mental acuity, involuntary choreoathetotic movements; psychic disturbances, including nightmares and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angina pectoris. Orthostatic hypotension (decrease daily dosage). Edema (and weight gain) usually relieved by use of a diuretic. (Discontinue methyldopa if edema progresses or signs of heart failure appear.)

Gastrointestinal: Nausea, vomiting, distention, constipation, flatus, diarrhea, mild dryness of mouth, sore or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundice, liver disorders.

Hematologic: Positive Coombs test, hemolytic anemia. Leukopenia, granulocytopenia, thrombocytopenia.

Allergic: Drug-related fever, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlargement, gynecomastia, lactation, impotence, decreased libido, dermatologic reactions including eczema and lichenoid eruptions, mild arthralgia, myalgia.


Note: Initial adult dosage should be limited to 500 mg daily when given with antihypertensives other than thiazides. Tolerance may occur, usually between second and third month of therapy; increased dosage or adding a thiazide frequently restores effective control. Patients with impaired renal function may respond to smaller doses. Syncope in older patients may be related to increased sensitivity and advanced arteriosclerotic vascular disease; this may be avoided by lower doses.

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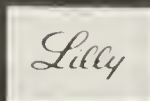
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Hyperkalemia Following Succinylcholine

LISA WILKINSON, M.B., B.S., F.F.A.R.C.S. (Eng.)

It is believed that not all our anesthesiologists are aware of the well documented phenomenon of hyperkalemia following the administration of the muscle relaxant succinylcholine in certain "at risk" patients. This review article is offered as a update for surgeons and anesthesiologists on a potentially fatal complication.

INTRODUCTION

During the 1960s several reports appeared in the anesthesia literature concerning patients who had suffered cardiac arrhythmias and cardiovascular collapse apparently following the administration of the depolarizing muscle relaxant succinylcholine. Although the initial reports highlighted the problem in patients with extensive burns,^{1,17} similar case reports followed concerning massively traumatized subjects,^{3,8} and patients suffering from spinal cord injuries.^{13,15,16} Many of the patients had undergone surgery and anesthesia immediately post-injury without incident, and had only developed complications when anesthesia was induced for further surgery at least two weeks after injury.

Following the administration of succinylcholine it was reported that electrocardiographic changes appeared, leading to ventricular fibrillation and cardiac arrest in some cases. Serial serum potassium values taken following succinylcholine administration showed markedly elevated levels.

Clinical and experimental studies

Doubts about the cause of the presumed hyperkalemic response to succinylcholine, and the mechanisms involved, led several investigators to initiate controlled clinical and experimental studies. Clinical series in normal and traumatized patients, and experimental studies in animals with transected spinal cords and denervated limbs have yielded results which may be summarized as follows:

- 1) Following the intravenous administration of depolarizing muscle relaxants such as succinylcholine, the serum potassium level rises (Average 0.5 mEq.).⁹ However, in normal subjects the increase is not clinically significant.
- 2) In susceptible patients marked increases in serum potassium levels occur following the injection of a bolus or continuous infusion of succinylcholine. Potassium values as high as 13.6 mEq/L have been recorded in human subjects.¹⁵ Electrocardiographic changes such as peaking of T waves, widening of QRS complex, disappearance of P wave, ventricular tachycardia, ventricular fibrillation have occurred, and cardiac arrest has followed in a number of patients.^{1,8,13,15}
- 3) Hyperkalemia following succinylcholine has been shown to be a dose-dependent response.⁷
- 4) The hyperkalemic response may be attenuated by the prior administration of a small dose of nondepolarizing muscle relaxant or almost completely blocked by a large dose.^{7,12,16}
- 5) The list of susceptible patients now includes those with severe burns, massive trauma, spinal cord injury, tetanus,¹¹ neuromuscular disease.⁴ Digitalized patients and those with an initially high serum potassium level^{10,11} may also become hyperkalemic following succinylcholine administration.
- 6) The period of time during which patients are at risk (using case reports as a guide) runs from about seven to ninety days, with a peak of vulnerability during the second month after injury.^{5,8,15,16}

Suggested mechanisms for hyperkalemia

- 1) After denervation the muscle membrane is altered and shows an atypical response to depolarization. The entire membrane becomes sensitive to acetylcholine so that depolarization takes place not only at the motor endplate but along the whole membrane. A nonselective increase in permeability of the cell membrane to

sodium and potassium occurs at the same time.²

The action of succinylcholine is similar to that of acetylcholine, although the effect lasts longer, therefore one may expect succinylcholine to depolarize the whole membrane of denervated muscle, causing marked potassium shift.

- 2) If venous blood is sampled simultaneously from the inferior vena cava and superior vena cava following the administration of succinylcholine in spinal cord transected patients and experimental animals, higher potassium values are obtained from the inferior vena caval blood. This suggests that muscle below the level of the lesion is the main source of excess potassium.^{14,15}
- 3) In burned patients there may also be muscle membrane damage and increased chemical sensitivity related to disuse atrophy.⁵
- 4) Many patients in the susceptible groups have extensive soft-tissue injury, are septicemic and in negative nitrogen balance. These factors may also play a role in the development of hyperkalemia.⁸

Clinical implications

Opinions concerning the clinical implications of succinylcholine hyperkalemia have been expressed with increasing force as clinical and experimental evidence have been produced to document the problem.

A review of the literature reveals the following opinions of investigators, and these are given in chronological order:

Clinical implications — comments

- 1) Birch et al (1969) "Even though a trauma patient has been anesthetized nine or ten times with succinylcholine uneventfully, one cannot assume that using the same type of anesthetic again will probably meet with equal success, especially if the patient is now at the time of maximum succinylcholine "sensitivity".³
- 2) Mazze et al (1969) "... results of the present investigation suggest that succinylcholine should not be used in massively traumatized patients after the initial surgical procedures, until all wounds are closed, infection is no longer present and catabolism is reversed."⁸
- 3) Tobey (1970) "I conclude that succinylcholine must be used cautiously, if at all, in paraplegics after the first 24 to 48 hours after injury."¹⁵
- 4) Stone et al (1970) "Since other techniques for endotracheal intubation which do not require succinylcholine are available . . . suggest that this agent should not be used during the vulnerable period in patients who have central nervous system injury with subsequent paralysis."¹³

5) Gronert and Theye (1975) "Succinylcholine is unequivocally contraindicated in the management of patients who have sustained thermal trauma or direct muscle trauma and those who have neurologic disorders involving motor deficit, including tetanus."⁵

The comments given above should be considered carefully when a patient in any of the "at risk" categories is to receive a general anesthetic or requires endotracheal intubation. The susceptible patients include those with severe burns, massive

trauma, spinal cord injury, neuromuscular disease. Sensitivity to succinylcholine may be present for a period as long as from seven to ninety days post injury.

Ideally, succinylcholine should be avoided in these patients. However, if there is some reason for an anesthesiologist to use the drug in an "at risk" patient its use should be preceded by a dose of a nondepolarizing muscle relaxant.

The review by Gronert and Theye (1975), which gives more detail of the pathophysiology of the problem and includes a more

comprehensive bibliography, is recommended to the reader.

BIBLIOGRAPHY

1. Allan, et al: Ventricular fibrillation in a burned boy. *Canad Med Assoc J*, 85:432, 1961.
2. Axelsson J., Thesleff S.S.: A study of supersensitivity in denervated mammalian skeletal muscle. *J Phys (London)*, 147:178-193, 1959.
3. Birch, et al: Changes in serum potassium response succinylcholine following trauma. *JAMA*, 210:494-493, 1969.
4. Cooperman, L.H.: Succinylcholine-induced hyperkalemia in neuromuscular disease. *JAMA*, 213:1818-1871, 1970.
5. Gronert, G.A., Theye, R.A.: Pathophysiology hyperkalemia induced by succinylcholine. *Anesthesiology* 43:89-99, 1975.

Complete bibliography available upon request

Nasal Septal Deflection In Prehistoric Arizona Indians

LEON L. TITCHE, M.D.

Here is presented an interesting facet of Arizona Indian tribal physiogomy.

There have been numerous articles written on deviations of the nasal septum both to explain the origin of this deformity in order to link it to racial characteristics and also to provide a better understanding for its surgical correction. This paper will present the occurrence of this condition in a group of prehistoric Arizona Indians and will compare the findings with those made previously in Indians in another part of Arizona and in another section of the United States.

ETIOLOGY

Fry¹ and Gray² reported that septal deviations generally were accepted as virtually peculiar to the human animal and the latter suggested that basic evolutionary factors which caused this were the assumption of the erect posture and changes in the shape of the skull. Other causes which have been given are intrauterine injury,³ birth trauma,^{2,4,5} hereditary factors,^{2,6} and developmental factors.^{1,6,7,8} Woods⁹ believed that heredity played little influence in bring about a deflected septum as he thought it was the condition affecting the development of the septum after birth which influenced its shape.

INCIDENCE

The incidence of septal deflections has been reported over a wide range. Jackson and Jackson¹⁰ believed that the adult who is entirely free from some deformity or deviation is the exception. DeWeese and Saunders¹¹ stated that there were few adults in whom the septum was in the midline and Sawhney and Sena¹² believed that it was far more common to find some deformity of the nasal septum than to meet one which was absolutely straight. The majority of authors^{12,13,14} has reported that the deviation was to the right in slightly over half of the cases. Males were found to have deviations more frequently than females by Gray⁵ and Ballenger,¹⁵ though Ali¹⁴ in 5096 cases found an approximately equal ration.

A.D. These people disappeared and the present day Indian inhabitants are not related to them in any way.

RESULTS

59 of the skulls could be identified as to sex and 12 could not, but all could be classified into age groups. Septal deviations were present in 62 percent, with male to female ratio of 19 to 21. There were 10 right sided deviations and 9 left side deviations in the males and in the females 15 deviations were to the right and 6 to the left. In the entire series, there were 28 right deviations and 16 left. (Table 1)

Three studies have been done previously on septal deviations in the American Indian. Steele¹⁶ examined 365 skulls with identifiable nasal septa from prehistoric

Table 1
Septal Deviation in Prehistoric Arizona Indians

Age	Skulls			Deviations					
				Male		Female		Undet	
	Male	Female	Undet	Right	Left	Right	Left	Right	Left
Less than 11			9					3	1
11 to 20	3	5	3	2	1	2	1		
21 to 30	6	10		3	3	5	3		
31 to 40	9	8		3	3	4			
Over 40	6	12		2	2	4	2		
Total	24	35	12	10	9	15	6	3	1

METHOD

The study being presented comprises 71 skulls with identifiable nasal septa from 645 skulls examined in the collection of the Arizona State Museum at Tucson, Arizona. These prehistoric Indian tribes were probably genetically related and occupied the area of the Mogollon rim country comprising parts of present day Navajo, Gila and Apache counties. The excavation sites are named Point of Pines, Grasshopper, Kinishba and Turkey Creek and were inhabited from about 1000 A.D. to about 1450

tribes in the Dakotas and found 57.5 percent with deviations and a male to female ratio of 1.5 to 1. Post⁶ found 30 per cent abnormal septa in 140 prehistoric Dakota Indian skulls and 20 per cent deviations in 171 prehistoric Pueblo Indian skulls. These findings and those of the present study are shown in Table 2, pointing out that the incidence of septal deviations in different Indian tribes varies quite a bit and possibly indicates a tribal characteristic. The near equal occurrence in males and females

Table 2

Author	Number of Skulls	Per Cent With Deviations
Steele et al ¹⁶		
(Dakota)	365	57.5
Post (Dakota) ⁶	140	30.0
Post (Pueblo) ⁶	171	20.0
Titche	71	62.0

possibly could rule out trauma as a cause and the greater number of right sided deviations also points to developmental or inherited characteristics. Studies such as these have the drawback in that the fragility of the bony nasal septum makes

its preservation difficult, as shown by the small number of skulls with identifiable septa in the large number which have been examined.

SUMMARY

A study of septal deviation in Indian skulls from the Mogollon rim country of Arizona has been presented and the findings compared with those of some other prehistoric American Indian cultures. It is conjectured that this condition may be a tribal characteristic. The prehistoric Indian cultures of Arizona offer a wealth of medical information which is of value today.

Acknowledgement

The author wishes to express his appreciation to Walter H. Birkby, Ph.D., Physical Anthropologist at the Arizona State Museum for allowing the use of the material and for his assistance.

BIBLIOGRAPHY

1. Fry HJH: The aetiology of so-called "septal deviations" and their experimental production in the growing rabbit. *Brit J Plastic Surg* 21:419-422, 1938.
 2. Gray LP: Septal and associated cranial birth deformities. *M J Australia* 1:557-563, 1974.
 3. Mikkelsen EM: A theory on deviated nasal septum. *Illinois M J* 50:506-508, 1926.
 4. Kemble JVH: The importance of the nasal septum in facial development. *J Laryngol* 87:379-386, 1973.
 5. Gray LP: The deviated nasal septum - aetiology. *J Laryngol* 79:567-575, 1965.
- Complete bibliography available upon request.



Case Report

Atropine Coma: Physostigmine Reversal

DAVID LAPAN, M.D. JAY W. SMITH, M.D.

The usual initial central nervous system manifestations of intoxication with anticholinergic agents such as atropine are excitation characterized by restlessness, irritability, disorientation and hallucinations, commonly grouped under the heading of "central anticholinergic syndrome".¹ The administration of doses of anticholinergic agents in the lethal range results in central excitation followed by depression, coma and death. In this communication we report a patient whose atropine overdose failed to produce central excitation, but did result in coma, which promptly responded to the administration of physostigmine, an anticholinesterase.

REPORT OF A CASE

Mrs. L. B., an 83 year old white woman, was admitted to an outlying hospital with a history of increasing weakness and chest pain. She was noted to have bradycardia by her admitting physician. Except for a history of myocardial infarction seven years prior to admission she was well until one month previously when she began experiencing anginal chest pain and increased here use of nitroglycerin. Two weeks prior to admission she saw her physician who noted atrial fibrillation with a rapid ventricular response and congestive heart failure; digoxin 0.25 mg per day, and furosemide 40 mg per day, were started. However, no change in symptoms occurred subsequent to this. On the day of admission atrial fibrillation with a ventricular response of approximately 30/minute was

noted. She was hospitalized, digoxin was stopped and 40 mEq of intravenous potassium was administered over 24 hours. There was no change in heart rate over 48 hours except for transient increases to a rate of 70/minute after 1 mg of intravenous atropine on three occasions within 36 hours prior to transfer. She was transferred on the third hospital day to the University Hospital for a cardiac pacemaker implant. At the time of transfer she was alert and oriented. Because of persistent bradycardia of 30/minute she received an additional 3 mg of atropine in the course of the three hour ambulance ride to the University Hospital. During this time she became progressively more obtunded and then comatose.

Physical examination revealed a comatose woman with no response to verbal stimuli. The blood pressure was 170/100, pulse 40-60/minute and irregular, respiration 24/minute and temperature 36.5°C. The skin was of normal color, moist and neither red nor hot. The fundoscopic examination was normal and the mucous membranes moist. The neck was supple. Bibasilar rales were heard on examination of the chest. Cardiac exam revealed a II/VI systolic ejection murmur at the base with radiation to the apex and neck. There was an S₃ gallop at the apex. The abdominal, rectal, pelvic and extremity examinations were without abnormality. Neurological examination revealed a comatose woman. She moved all extremities and had occasional incoherent mumbling. The pupils were 3 mm and reactive. Oculocephalic reflexes were intact as were corneal reflexes. The deep tendon reflexes were 2+ bilaterally and toes dorsiflexed bilaterally.

Laboratory data revealed a hematocrit of 46%, white cell count of 9300/mm³ with a normal differential. The urinalysis was normal. The Na was 142, K 4.7, Cl 99, CO₂ 32 mEq/L. The BUN was 15, creatinine 0.9 and glucose 122 mg/dl. The VDRL was negative. The SGOT was 21 units (normal 20), CPK 67 units (normal 90), bilirubin 1.1 and the calcium 10 mg/dl. The T₄ 10.6 mcg/dl (normal 4-12) and T₃ 33.6 (normal 25-35). The digoxin level was 1.1 ng/ml. Blood gases revealed a PO₂ of 55 mm of Hg, saturation of 91%, PCO₂ 40 mm Hg and pH 7.44. A lumbar puncture was normal as was the chest x-ray. The EKG showed atrial fibrillation with ventricular bigeminy and prolonged pauses with a rate of 30-60/minute, left ventricular hypertrophy by voltage and nonspecific ST and T changes.

Prior to receiving the report from the ambulance driver that the patient had received 3.0 mg of atropine during the course of the three hour ambulance ride, an additional one mg of atropine was given with an increase in heart rate to 70/minute but no change in mental status. The possibility to atropine intoxication was considered following the history from the ambulance driver and realizing that the total dose of atropine was 4.0 mg over four hours. A transvenous temporary pacer was placed and 2 mg of intravenous physostigmine administered. Within two minutes there was rapid reversal of obtundation and the patient became alert and conversant. Over the next 72 hours the patient remained alert. The bradycardia remained and a permanent pacemaker was placed before the patient was discharged in good condition on the ninth hospital day.

From: The University of Arizona College of Medicine, Department of Internal Medicine, Tucson, Arizona.

DISCUSSION

The patient developed severe central nervous system depression following 4.0 mg of atropine. She was taking no other drugs with anticholinergic like activity such as tricyclic antidepressants, antipsychotics (phenothiazines - butyrophenones), antispasmodics, antihistamines or drugs used to treat Parkinson's disease. Neither bizarre behavior nor mental symptoms or signs suggesting an organic psychosis preceded the coma.

The central nervous system excitatory effects of atropine are usually seen when greater than 5.0 mg have been given over a short period of time. Central nervous system depression results following 10.0 mg or more.² The toxic dose of atropine may be age related; an adult has survived 1000 mg,³ while 10.0 mg or less may be lethal in children. It has been suggested that the elderly are especially prone to develop the "central anticholinergic syndrome" following treatment with tricyclic antidepressants and antipsychotics.⁴ Moreover, it is likely that anticholinergic drugs have toxic effects at lower doses in the elderly, because of a decreased capacity to metabolize (inactivate) drugs, a diminished renal and hepatic capacity for drug clearance and an enhanced sensitivity to the central nervous

system depressant action of drugs in general.⁴

Physostigmine is an anticholinesterase which readily crosses the blood-brain barrier. It reverses the toxic effects of atropine in the brain by increasing the level of acetylcholine in the central nervous system. It has been used successfully in treating the central nervous system toxicity of a number of drugs with anticholinergic activity^{5,8} as well as the cardiac toxicity of the tricyclic antidepressants.⁹ Foner and Miller¹⁰ reported dramatic responses to physostigmine in patients who had therapeutically induced atropine coma. They found that neither the dose of atropine nor the duration of coma bore any relationship to uniformly successful responses to 4.0 mg of intravenous physostigmine. Since physostigmine is rapidly metabolized, reported doses may be required every 30-60 minutes.⁶

Because a number of widely used drugs have anticholinergic activity—tricyclic anti-depressants, antipsychotics, antihistamines, anticholinergics used for sedation, therapy of peptic ulcer, and for the treatment of Parkinson's disease—and because the central nervous system excitation phase of the "central anticholinergic syndrome" need not be manifest, intoxication by drugs with anticholinergic activity

should be considered in all comatose patients. Reversal of the coma with physostigmine is diagnostic.

SUMMARY

Numerous drugs have anticholinergic activity which usually causes central nervous system excitation followed by depression. The patient we report with moderate atropine overdose did not manifest the central excitation phase, but presented with coma which was rapidly reversed with physostigmine, and anticholinesterase. Intoxication by drugs with anticholinergic activity should be considered in all comatose patients.

Complete bibliography available upon request.

QUERIES AND NOTES

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Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported. More detailed professional information available on request.

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A MATTER OF OPINION

JOHN W. KENNEDY, M.D.

Common Sense is the most uncommon thing there is (Proverb)

As long as the federal funny money, for physical plants and laboratories, funds for research was poured into our medical schools there was scarcely a murmur of dissent. Sure there was some grumbling about the stacks of forms and the many guidelines and the multitude of project managers to be satisfied. The mountains of paperwork makes the bureaucrats able to justify their existence and skim the top 20 - 30 - 50% off congressional appropriations.

There were some pessimists around, but their dissent was dismissed as archaic and nonprogressive. As early as 1938 Dr. James Ewing, the revered Master Pathologist of Memorial Hospital, New York, decried the dilution of research efforts caused by founding the first of the National Institutes of Health, Cancer. He foresaw that, as new and separate physical plants were constructed, that the time needed to acquire and train a staff of excellence would take 20

years. A great loss in time and effort.

Now the NIH programs are at a standstill. The Washington bureaucrats, the Congress and the new White House occupant will have a great "study of the problem." Reports are that this will require a year or more. Surely a sad way to direct the national research effort!

The long arm of HEW has through the "Health Professions Act" directed that medical schools, which receive federal funds, has directed these schools to accept a quota of Americans who have completed two years in a foreign medical school and passed part I of the National Board of Medical Examiners Test.

Honestly, fellow physicians if you were a HEW policy maker — and controlled these millions in grants — wouldn't you push your own set of acceptance conditions? We may deplore the method, but its just about as effective as deploing human nature. He who pays the piper, calls the tune.

The medical schools fear, and with reason, that soon the HEW moguls will

twilldle the curriculum knobs and dictate exactly how many generalists and specialists shall emerge each year, and where they shall practice.

There is one piercing ray of hope. Already three medical schools, Indiana, Stanford and Yale Universities have stated they would reject their federal aid to the tune of 10 million dollars total. There may be some chance of getting a legislative change. But the HEW planners will always be waiting and planning their "take over".

We have no way of knowing how many medical schools could survive without federal funds, probably few for long.

To paraphrase a musical "they have become accustomed to her ways," the way of funny money.

Someone recently noted that non-profit institutions begin their decline as soon as a central elegant headquarters building is erected.

Let us hope our great medical schools do not meet the same fate in their federally funded edifices of equalitarianism.



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Dean's Page

RURAL HEALTH PROGRAM

The University of Arizona's College of Medicine has been involved in many rural activities throughout the state. Examples include the Arizona Perinatal Program, which is operated by the Department of Obstetrics in collaboration with the Arizona Medical Association Foundation, and Mobile Eye Clinic, operated by the Ophthalmology division of the Department of Surgery. These and many other activities are making an important contribution to improved rural health services in the state of Arizona.

The focus of this article, however, will be on the rural health program activities of the Department of Family and Community Medicine. This Department, having the responsibility both for community development activities and for training family physicians, early assumed a leadership role in both developing and providing services for underserved rural communities.

This month (March 10-11) many of these activities will be discussed in relationship to the Sixth Annual Arizona Conference on Rural Health. Another example of a

cooperative relationship between the Arizona Medical Association and the University of Arizona, this conference has been successfully cosponsored by ARMA, the U of A and other health related institutions so as to provide a forum for discussion of important health issues affecting rural communities. Last year this conference was held jointly with the 29th National Conference on Rural Health for the American Medical Association.

As the Rural Health Conferences were getting underway, the Department of Family and Community Medicine was initiating its involvement in the communities of Marana, Benson and Casa Grande. Always responding to expressed community need the Department assisted in procuring National Health Service Corps commitments for Marana and Benson and, in collaboration with Arizona Health Planning Authority, a migrant health grant for what was then Arizona Job Colleges in Casa Grande. Each of these programs has continued to grow and prosper with expanded budgets and patient populations

all are (or soon will be) in modern and spacious facilities, one of which was provided through Hill-Burton and foundation grant support.

In the meantime, the Department was developing an active service program, funded in part through a grant from the Federal Government for the creation of the Southern Arizona Rural Health Initiative program. This program, SOARHI, has served to support primary care services in the clinics of Benson and Marana and to stimulate the development of a new cooperative entity, the Arizona Rural Health Federation. The SOARHI program, in turn, has been successful in developing a recently funded grants program which provides over \$260,000 to the Federation for work in six communities (Marana, Benson, Casa Grande, Bowie, Patagonia, and Globe) in five southern Arizona counties.

Integral to University service activities in rural health is the teaching program which has been associated with these activities. A Manpower Distribution Demonstration Project places a student team in the field supported by ancillary staff and equipment. This project has also supported the teaching of residents in areas outside of metropolitan Tucson. In general, rural clinics developed in association with the University may provide space for the training of future doctors who might practice in these or other rural areas. Such rural placements at the student and resident level have proven effective in many areas in improving the distribution of health manpower to the benefit of rural communities.

A specialized program which combines the resources of the teaching and service efforts of the Department is the Arizona Mobile Health Clinic. Like the Mobile Eye Unit, this unit is made available to clinics and communities that wish to use it for the expansion of their health services, particularly in more remote areas. Currently operating in Rillito and the Yaqui Village outside of Marana, the Arizona Mobile Health Clinic represents a common outreach effort of the Arizona Rural Health Federation and the University of Arizona as they work with established clinics to provide health services in outlying areas.

A program of particular interest to both the University and the Arizona Medical Association at the present time is the Arizona Health Service Corps. This project, developed by the Arizona Medical Association with input from the Department of Family and Community Medicine, now is a funded program with potential service activities throughout the state. To be housed in the Arizona Medical Association offices in Phoenix, this program will address many of the problems concerning the effective distribution of health manpower in Arizona. The University is a joint participant in this Arizona Health Service Corps contract and, in this connection, has

been able to augment its support of the Benson program.

The Department of Family and Community Medicine is engaged in a number of other activities which are designed to improve health care in rural areas. These include the Nurse Practitioner Training Program, a joint effort with the University of Arizona College of Nursing, and the Community Health Medics training course, operated under contract with the Indian Health Services. Still another effort is the Preceptorship Program of the Department which places medical students with physicians throughout the state, but with a particular emphasis on rural areas. Currently, particular attention is being focused upon Kingman, Ganado and Morenci as representative Arizona communities.

Many of the rural health activities of the Department of Family and Community

Medicine are housed in a rural health program building at 1145 N. Warren St. This facility, purchased by the Board of Regents to facilitate rural health program efforts of the University, stands as a symbol to the ever widening concern of the College of Medicine as it addresses the task of improving the quality of health care delivery in Arizona. It is satisfying that much of the progress which has been achieved to date, such as the Annual Rural Health Conferences and the evolution of an Arizona Health Service Corps, represents collaborative efforts by the University and the Arizona Medical Association.

Noel A. Vauselow



President's Page

RISING COSTS

EDWARD SATTENSPIEL, M.D.

The following thoughts have come from the much maligned but often perceptive AMA and seemed worthy of passing along to you.

Various forces in Washington are jumping with glee at the thought that they have found the Achilles' heel at which to attack private medicine: rising costs.

If you recall your Homer, the heel was the one part of the body in which the Greek hero was vulnerable.

No longer can Washington accuse physicians of being 50,000 short in numbers. It cannot gainsay the peerless competence of American medicine. It cannot deny what the polls show: that most Americans are satisfied with the quality and availability of their care.

But rising costs—sensationalized by charges of Medicaid fraud on the part of a tiny minority of doctors—are being exploited as an excuse for an all-out move against our profession and its freedom.

Rate setting for medical services has been suggested by the Democratic platform and by Jimmy Carter. A move to make it mandatory in all states is likely to be made when the Health Planning Act comes up for extension in 1977—provided that law survives the joint suit of North Carolina and the AMA.

Yet, on the cost issue too, we physicians are generally invulnerable in fact, contrary to the thinking of some politicians.

The climb in costs is largely due to impersonal factors that far transcend the personal ability of health-care providers to control them.

These factors include the growth and expansion of clinical competence and technology, the growth of health insurance and its incentives to better care, the relentless surge in professional-liability premiums. They also include greater longevity (and thus a greater incidence of chronic illness), steady inflation, and the network of administrative and procedural expenses engendered by federal involvement in care.

Further aggravating the cost problem is the absence of any quantitative limit on what medicine is supposed to do with its technology, or expected to do. Sophisticated surgery that may stretch life by a few years is unavoidably expensive, and that expense has to be reckoned with if life is to be so stretched.

Obviously, the Topsy-like growth in the demand for, and capabilities of, medical care since World War II has caused overlaps, imbalances, and disarrangements—particularly at the institutional level—and these should be relieved by voluntary planning. The AMA's blue-ribbon National Commission on the Cost of Medical Care, representing many walks of life (including government), is seeking to place the cost problem in its true perspective, so that practical remedies can be offered.

But there is no valid reason for government to try playing the role of marksman Paris and shoot an arrow at private medicine's heel.

Let us bring the real facts of medical costs to our state and communities in every way we can. The people must know that if government tries to do the worst to us, we can no longer do the best for them.



THE NON-HODGKIN'S LYMPHOMAS

STEPHEN E. JONES, M.D.

INTRODUCTION

Between September 30 and October 2, 1976, in San Francisco, California, the National Cancer Institute sponsored a symposium on the non-Hodgkin's lymphomas (NHL) to review the most current information regarding these neoplasms and to suggest areas for future investigation. It became apparent during the course of this meeting that there is still a lack of uniformity in approach to patient management which continues to make comparison of the results of various modalities of treatment, particularly in relation to the natural history of these diseases, quite difficult. Although many controversies and gaps in our knowledge still exist, adequate information is already available to provide a sound framework both for good patient care and for future clinical investigation. In this paper I have attempted to summarize the "state-of-the-art" for the management of adults with the NHL.*

GENERAL CONSIDERATIONS

The non-Hodgkin's lymphomas (NHL) represent a heterogeneous group of neoplastic diseases which originate from cells of the immune system. They are relatively common (about 20,000 cases annually in the U.S.) and occur in an older population than Hodgkin's disease. The childhood forms resemble leukemia more often than lymphoma and are a special problem which will be considered in a later issue of *Arizona Medicine*. Although many factors must be taken into account for the ideal management of an individual patient (age, general health, availability of specialized medical facilities), the optimal time to offer patients either potentially curative treatment or the benefit of prolonged remission is at initial presentation to the physician.

HISTOPATHOLOGY

The accurate diagnosis of NHL by an experienced hematopathologist is essential. Often it may be advisable to send the slides from the initial biopsy for additional consultation. When pathology review is routinely carried out, the diagnosis of NHL will be confirmed in more than 95% of

cases, but disagreement regarding the diagnosis of specific subtypes of NHL occurs in 40%-50% of cases. Almost all of the studies which have successfully related clinical features, response to treatment, and prognosis to histologic type of lymphoma have employed strict hematopathology review. Thus, if there is any question that the clinical features are inconsistent with the tentative histologic diagnosis the slides should be sent for a further opinion. This is the most certain means of avoiding the common pitfalls of (a) incorrect histologic diagnosis, (b) inadequate staging (e.g., a staging laparotomy might be indicated if the diagnosis is Hodgkin's disease, but not if it is diffuse histiocytic lymphoma), and (c) inappropriate treatment (e.g., too little, too much, or the wrong type).

The only histopathologic classification which has proven clinical value at this time is the scheme of Rappaport. With the Rappaport classification, a critical distinction is whether the lymphoma has a nodular (follicular) or a diffuse pattern of involvement of the lymph node. Nodular lymphomas, which comprise one half of all NHL in adults, are much more responsive to treatment of all types and are associated with a natural history that is considerably more favorable than that for diffuse lymphomas. In most cases, pathologists can readily and reproducibly recognize nodular lymphomas. (Cases in which both nodular and diffuse patterns can be found on the same section should probably be regarded as nodular lymphomas.) Additionally, the two most clinically important and common histologic subtypes of the Rappaport classification—diffuse histiocytic lymphoma and nodular lymphocytic lymphoma—are correctly identified by pathologists about 80% of the time. The other pathologic subtypes are properly classified with considerably less consistency.

Recent objections to the Rappaport classification system, especially its use of the terms "histiocyte" and "differentiation," stem from attempts to identify tumor cells by immunologic and cytochemical markers and/or by electron microscopy. Most of the NHL, including all Burkitt's and nodular lymphomas, as well as some of the diffuse lymphomas, are B-cell-derived malignancies. There are only a few well-established examples of T-cell-derived tumors: Sézary cell syndrome, mycosis fungoides, most if not all of the "lymphoblastic" tumors (which are often associated with mediastinal mass presentation in adolescents and frequent development of peripheral blood or central nervous system involvement), and a minority of other diffuse lymphomas. Some of the diffuse large cell lymphomas appear to lack markers which could identify them as being T or B cell derived (i.e., "null" cell lymphomas). True "histiocytic" tumors (where the cell unequivocally arises from the histiocyte-

macrophage cell line and retains functional markers) are rare and most of the lymphomas termed "histiocytic" or mixed cell type by the nomenclature of the Rappaport classification now appear to be of lymphocytic origin.

These latest observations on the biologic origins of the cells composing the NHL have resulted in at least 5 new proposals for the classification of these tumors including that proposed by Lukes and Collins. However, there is little or no information regarding the *clinical usefulness* of these classifications and, hence, it was the consensus in San Francisco that because of the paucity of clinical correlations with *any* of the newer classifications, use of the Rappaport classification should continue for now.

INITIAL STAGING EVALUATION

Since most of the NHL appear to be disseminated at the time of initial presentation, the initial clinical evaluation after diagnosis should be based on this assumption and those procedures which are most likely to confirm the disseminated nature of the lymphoma should be performed first (Table 1).

Some of these procedures have a very high diagnostic yield. For example, 50%-80% of patients with nodular lymphocytic lymphoma have bone marrow involvement demonstrable by biopsy. Similarly, many of these patients have microscopic involvement of the liver despite normal liver function studies or liver scans. Lymphangiograms are also abnormal in 80%-90% of patients with nodular lymphomas and in 40%-50% of those with diffuse lymphomas. Staging laparotomy should be reserved for a highly selected group of patients when knowledge about abdominal disease would alter therapeutic decisions or for patients requiring splenectomy for hypersplenism.

This initial diagnostic evaluation not only defines the extent of disease, but, as is now clear, also serves other major purposes: 1) Some sites of involvement have importance either in treatment planning or as adverse prognostic factors in predicting response to treatment (e.g., portal or mesenteric lymph node involvement if abdominal radiotherapy is being considered). 2) Certain potential sites of disease may require special prophylactic treatment (e.g., the central nervous system in mediastinal lymphoblastic lymphomas). Finally, The initial precise definition of sites of involvement serves as a basis for a careful restaging examination to assess the results of treatment.

STAGING CLASSIFICATION

After careful staging, about 10%-15% of patients with nodular lymphoma and 30% of those with diffuse lymphoma will be found to have localized disease (Stages I, I_E, II, II_E); the others will have documented widespread disease (Stage III or

From: Section of Hematology and Oncology, Department of Internal Medicine, University of Arizona College of Medicine, Tucson, Arizona 85724. The complete proceedings of this meeting will be published in *Cancer Treatment Reports* within the next six months.

IV). The staging classification generally in use is the Ann Arbor system.

RESTAGING EVALUATIONS

The objective of most current treatment programs has been to induce complete clinical remissions and, in general, survival parallels the completeness of the response. However, it was apparent at this symposium that the results of one treatment program cannot be compared to those of any other unless apparent complete remissions are carefully documented by a thorough and systematic restaging evaluation as outlined in Table 2.

Restaging detects otherwise inapparent residual lymphoma in 20%-30% of those patients who appear to be in complete clinical remission, even when only simple and minimally invasive procedures are repeated (bone marrow core biopsy, liver biopsy, lymphography). In most of these cases, residual disease is predictably found in sites originally involved by lymphoma. Thus, restaging should include the repetition of initially abnormal studies. There is already some evidence that a documented complete remission is quite important prognostically and may have value as an endpoint in treatment. Similarly, the detection of persistent lymphoma is an indication for continuation of treatment.

TREATMENT

Since most of these lymphomas are disseminated at the time of discovery, systemic treatment is usually required. High-dose extended-field or total-nodal irradiation as employed in the treatment of Hodgkin's disease probably has little role by itself in the management of these diseases, although combined modality radiotherapy and chemotherapy programs are still under investigation for carefully selected patients. On the basis of material presented at the symposium, I am outlining my opinions regarding reasonable (but not all-inclusive) approaches to treatment, *predicated on accurate knowledge of histopathologic type and extent of disease.*

Nodular Lymphomas

There is no convincing evidence at this time to suggest that nodular lymphomas are curable, despite their favorable natural history. These diseases are prone to annual rates of relapse (appearance of new manifestations of disease) of 10%-15% for several years after therapy (irradiation or chemotherapy) is discontinued. Thus, for the 10% or so of patients who appear to have localized disease following completion of initial staging, a reasonable therapeutic approach might consist of only irradiation of known sites of disease. Eventually most, if not all, of these patients will have new manifestations of lymphoma and then require chemotherapy.

For the remaining 90% or so of patients with documented systemic nodular lymphoma, several therapeutic options appear

Table 1

Staging Procedures Employed in Evaluating the NHL*

Essential Staging Procedures

1. Careful history with attention to the presence of night sweats, unexplained fever, weight loss, or gastrointestinal (GI) symptoms.
2. Careful physical examination with particular attention to all lymph node chains (the epitrochlear, femoral, infraclavicular, and submental regions are frequently overlooked), Waldeyer's ring (tonsils, pharynx, nasopharynx), and abdomen (mesenteric nodes, abdominal masses, enlargement of the liver or spleen)
3. Routine laboratory testing: CBC, liver function tests, calcium, and uric acid.
4. Core needle biopsy of bone marrow (? bilateral iliac crest biopsies)
5. Cytologic examination of any effusions
6. Chest x-ray and lymphangiogram

Useful Procedures in Certain Patients

1. Additional laboratory tests: sedimentation rate, Coombs' test, serum protein electrophoresis
2. Chest tomograms *if* any abnormality is observed on plain x-ray films
3. Intravenous pyelogram *if* bulky retroperitoneal nodes are present or *if* abdominal radiation therapy is planned
4. Roentgenographic examination of the gastrointestinal tract *if* the patient has GI symptoms or signs
5. Radioisotopic evaluation as needed of liver, bone, brain; scan with gallium 67 citrate or indium-111-labeled bleomycin
6. Abdominal and pelvic sonography
7. Percutaneous liver biopsy or laparoscopy with liver biopsy *if* the bone marrow biopsy specimen is normal (particularly in the lymphocytic lymphomas)
8. Immunologic evaluation: skin tests (Varidase, inumps, Candida); immunization with neoantigens (DNCB, KLH); peripheral blood lymphocyte typing (particularly if neoplastic cells are present in the bone marrow or peripheral blood); serum immunoglobulins
9. Finally (in highly selected patients): exploratory laparotomy with splenectomy, wedge biopsy of liver, and biopsies of para-aortic, mesenteric, portal, and splenic hilar lymph nodes, *if* the results might influence choice of therapy

*Many of these procedures are also used for Hodgkin's disease, but the order in which they should be performed is quite different.

Table 2

Procedures to be Used in Restaging Patients in Apparent Complete Remission

1. Careful physical examination
2. Biopsy of any residual enlarged lymph nodes, particularly if the region was involved initially
3. Routine laboratory tests: CBC, liver function studies, etc.
4. Chest x-ray (with whole-lung tomograms if initially abnormal)
5. Bone marrow core biopsy (? bilateral biopsies)
6. Repeat other initially abnormal studies:
 - a) lymphangiogram (or followup abdominal x-ray if dye persists)
 - b) liver-spleen scan
 - c) abdominal and pelvic sonography
 - d) percutaneous liver biopsy
 - e) laparoscopy with liver biopsy
7. Consider exploratory laparotomy in highly selected cases
8. New techniques (unproven)
 - a) computed axial tomography
 - b) skin biopsies of previously involved dermal sites with electron microscopy
 - c) in vitro techniques for detecting small numbers of residual tumor cells

equivalent in terms of survival and, hence, would appear to be reasonable forms of initial therapy:

No treatment — There is a group of patients (the exact percentage is as yet undefined but would appear to be in the order of 10%-25% of those with predominantly nodular lymphoma) who appear to have more indolent disease. In these pa-

tients, observation without specific treatment may be valid. However, most of these patients will eventually have progression of disease (increasing adenopathy or organomegaly, the development of constitutional symptoms, etc.) and then will require one of the following types of systemic therapy.

Single-agent chemotherapy — A control-

led trial of daily oral cyclophosphamide or chlorambucil at Stanford suggests that this form of treatment adequately controls disease in many patients with favorable lymphomas and is not inferior in terms of survival to more aggressive combination programs. The long-term relative merits or hazards (? leukemogenesis) of continuous single-agent treatment in comparison to other forms of therapy still need to be defined. However, this is an well-tolerated and easily administered form of treatment.

Total-body irradiation (TBI) — Rekindling of interest in this old technique of administering systemic irradiation and recent comparative trials of TBI vs. combination chemotherapy indicate that TBI is an effective form of treatment, especially in patients with nodular lymphoma and those with diffuse, well-differentiated, lymphocytic lymphoma. Thrombocytopenia has been a problem in some patients and others have required "boosts" of irradiation to sites of bulky disease which do not completely regress with courses of TBI. This form of treatment has *not* been particularly useful in relapsing patients and should probably be considered only as one type of initial treatment.

Combination chemotherapy — There are several schedules combining cyclophosphamide, vincristine, and prednisone ("CVP" or "COP") for use in patients with NHL. At this time, none of the newer combinations of agents appear to be superior to CVP, although several other combinations show promise. A combination of adriamycin, bleomycin, and prednisone ("ABP"), for example, appears to be a "non-cross-resistant" combination in relation to CVP and can be used as a second-line treatment in patients failing on CVP.

Duration of treatment — In patients with nodular lymphoma, it would appear reasonable to discontinue treatment once careful restaging has established that initially involved sites of lymphoma are free of residual disease. Most of the above forms of treatment can induce complete remissions in 50%-80% of patients with nodular lymphoma, and some of these remissions persist for very long periods of time without additional therapy. Although many of these patients will eventually relapse while off treatment, re-treatment can frequently induce another remission.

Diffuse Lymphomas

These lymphomas range from the very favorable well-differentiated lymphocytic form (which resembles chronic lymphocytic leukemia in its natural history) to the very malignant American Burkitt's or undifferentiated lymphomas. Historically, the diagnosis of diffuse histiocytic lymphoma also carried an ominous prognosis, but there is mounting evidence to suggest that histiocytic lymphoma may be the only type of

NHL at this time which can be regarded as potentially curable.

Localized Disease: After careful staging, one third of patients with diffuse lymphoma will be found to have localized (Stage I or II) disease. Stage I disease may be appropriately treated with high-dose local irradiation alone. Although some patients with Stage II disease may be cured with radiotherapy alone, combined modality program are currently being tested to improve the results obtained with radiation alone. In clinical practice, reasonable treatment at this time would be local irradiation followed by adjuvant chemotherapy for 6-12 months.

Advanced Disease: For the remaining two thirds of patients—those with advanced stages of diffuse lymphoma—chemotherapy appears to be the treatment of choice. Although many drug programs have been evaluated, it is not yet possible to define precisely which drug program may be the most effective. These treatment programs are potentially more complicated and more toxic than those mentioned for the treatment of nodular lymphoma and, accordingly, they should only be administered by, or under the direction of, a physician experienced in their use and side effects.

(A) "**CHOP**": This combination of adriamycin, cyclophosphamide, vincristine, and prednisone is administered at 3-4 week intervals and appears to be superior to adriamycin, vincristine, and prednisone alone ("HOP"). Complete remissions are obtained in 60%-70% of patients with diffuse lymphoma who are treated with "CHOP".

(B) "**C-MOPP**": This 4-drug program substitutes cyclophosphamide for nitrogen mustard (MOPP is used most often in the treatment of Hodgkin's disease) in combination with procarbazine, vincristine, and prednisone. This regimen has produced documented complete remissions in about 45% of patients with diffuse histiocytic lymphoma.

(C) "**COMA**": This combination of cyclophosphamide plus cell-cycle-active agents (vincristine, methotrexate with citrovorum "rescue," and cytosine arabinoside) also produces a high percentage of durable complete remissions.

Duration of treatment: This is largely unknown as is the potential value of "maintenance" chemotherapy. In histiocytic lymphoma, a careful re-evaluation which fails to detect persistent disease is a clear indication to stop treatment. About 40% of patients with advanced diffuse histiocytic lymphoma can achieve prolonged, unmaintained, complete remissions with chemotherapy as detailed above. Patients with this disease tend to relapse rapidly (e.g., within 1 year after treatment) or not at all when treatment is stopped and data from several centers now support the view that histiocytic lymphoma is a potentially curable neoplasm.

FUTURE DIRECTIONS

Many aspects of these diseases are still not well understood. Basic research into the biologic nature of the malignant cells and the search for etiologic factors must continue. More information on the clinical and prognostic value of immunologic marker studies is needed. The National Cancer Institute is presently launching a major study to attempt to resolve some of the differences among the 5 newly proposed schemes of histologic classification. A revised staging system is also needed. The development of new agents (for immunotherapy and chemotherapy), combination of agents, and combined modality treatment programs, the use of cell kinetics, and a consistent approach to patient management will, we hope, lead to improved survival as well as improved quality of life for patients with NHL.



*Obstetrics
and Gynecology*

DEVELOPMENT OF THE "MATERNAL ROLE"

SUZANNE BARCLEY, R.N.

DONALD J. ZIEHM, M.D., EDITOR

Within the ever expanding field of "Perinatal Medicine", as in any rapidly developing specialty, it is easy for health team members to focus on the most concrete issues, such as diagnostic procedures, new equipment, and research. Often the patient as an individual, a developing mother, is neglected. It is this aspect of mothering, its relationship to the high risk patient, and the professional's role in the process of mother-infant attachment that will be presented.

CONCEPT

Maternal role taking is a process that continues throughout life, beginning long before pregnancy occurs. As a child she begins to assume a role by the perception of that particular role as it is operating in her environment. Behaviors and actions of a particular role are acquired, conditioned reinforced learnings and are culturally determined. Through these processes the child adapts the ways of others in her environment. She begins to take on the role of mother mainly through imaginative processes in play-acting, fantasy, and identification.

Presented at the Perinatal-Neonatal Symposium, April 22, 1976.

Reprint requests to Dr. Ziehm, 1728 W. Glendale Ave. Phoenix, AZ 85021.

Play-acting is an overt behavior that permits practice of a role. This gives the opportunity to try different behaviors. Fantasy is a covert behavior that provides a silent rehearsal of roles in real or imagined situations. Identification with the qualities and feelings of another, adds to the possibilities of role acquisition. Identifying with the female sex role in early childhood is the beginning of the maternal role. And as the child grows older, she continues this process—mainly identifying with her own mother and significant other females in her environment. Copying the behaviors of these various role models results from this identification.

Throughout the pregnancy cycle specific behavioral changes can be observed. The behaviors specific to each phase are usually seen in all women going through the process of becoming a mother. However, in the woman labelled "high risk" the expected behaviors may be replaced by others.

Rubin and Caplan have described the behaviors as related to the phases of the "maternity cycle". With the first suspicion of pregnancy she begins to experience a developmental crisis. Even if a pregnancy is desired and conception was planned, the time, for one reason or another, is not right now. There is a resistance to the idea of pregnancy and the woman experiences this as an unexpected event. An initial reaction of rejection and anger may be demonstrated by the physical symptoms of hyperemesis or extreme fatigue. The conflict is the pregnancy itself, not the fetus, since it is not yet a reality. She seeks validation of her condition, looking for changes in her weight, appearance and bodily functions. During this first trimester, behavior begins to change, and she may begin to alienate herself from her usual activities, interests and relationships.

During the second trimester a significant positive sign occurs—quickening. This fetal movement brings with it a new set of behaviors and attitudes. Caplan labels this stage as one of developing affiliative response to the fetus. The mother becomes introspective and fantasizes about what the child will be, what it will look like, and how she will be as a mother. These wish-fulfilling ideas are significant in that they attribute to the fetus a human set of personality characteristics. There should be outward evidence of the mother's preparation for her baby (nest building) through choosing names, readying clothes, space, and furniture for the baby. This is a time during which the mother, although emotionally invested in her own well-being, also thinks of the fetus within her and develops a sense of attachment and value toward it. During this phase the mother becomes more extroverted and seeks new acquaintances, preferably pregnant ones. She will visit people who have children, asking numerous questions about the

children and mothering tasks, and may test out some of these tasks herself. She reads about parenthood, babies, delivery, and seeks out childbirth education.

During the third trimester the questions of "what kind of mother will I be" and "will I like motherhood" appear. She becomes very protective of the unborn baby and remains at home more often. Now that the plans are complete she is ready to deliver her baby.

A new set of behaviors begins with the onset of labor. As labor progresses she becomes introverted, egocentric, and concerned only with what is going on inside her body. She experiences fear—produced by her feelings of loss of control and of giving up part of herself. With this she will begin her "grief work." Described by Rubin, this is the "letting go" of a former identity in a role that is incompatible with the assumption of the new role—mother. It is a review, in memory, of attachments and events of a former role and serves to loosen the ties with the former self. The mother is then ready to set aside former roles and attachments for a new role. She will go into great detail about labor and delivery in order to verify her experience. As in grieving over any loss she will remember mostly the pleasant aspects of the experience. Opportunity to recall these events must be provided in order to move on quickly to the next phase. During this time the mother experiences the "maternal time lag" (Caplan). She is making the adaptive step from a relationship to the fetus which is fantasy-based to one which is reality-based. She now responds to the infants' appearance and reactive patterns.

The next phase in maternal role-taking is that of "taking in." It lasts 2-3 days and is a time of primary concern for the immediate needs (sleep and food). She is generally passive, dependent, and initiates little activity. Even simple decisions are difficult to make. For this reason *telling* her to do tasks is more effective, since this doesn't involve a decision on her part. The mother is extremely talkative, reviewing labor and delivery in order to put it all together, to absorb the experience, and to make it part of herself. This behavior cannot be taken lightly. Enthusiastic listening is necessary to give meaning to the whole experience. The listening and the encouraging words give her the ego support so greatly needed as she prepares to enter the next phase.

The "taking hold" phase, in which emphasis is on the present, begins about the third post-partum day. She becomes impatient and is driven to the organized and in command of her situation. This independence and assertiveness allow her to make her own decisions. She is regaining control of her own body and is able to care for another. She turns from self-concern to that of maternal concern for her child. Mothering tasks take a priority and she begins to assume the mothering role. She

becomes hypercritical and easily frustrated with the least failure. For this reason she must be praised for what she does, provided with opportunities for success, and be reassured of her progress. This phase will last about 10 days — 10 days of learning to care for her baby and of adopting the mothering role.

HIGH RISK PREGNANCY

At any time during a pregnancy a woman may be labelled "high risk." What effect can her learning this have on establishing the mother-infant relationship? The initial reaction is a preoccupation with herself—the problems that designate her as "high risk", her ability to have a baby, fears for her own survival. The fetus becomes secondary. When she begins to think of the fetus again it is in terms of the adverse effect they may be having on each other, angry with the fetus for interfering with her well-being. Thus we see the beginning of maladaptive behavior.

Early detection of compromising factors that could influence the mother's capacity to develop a tie with the infant is of utmost importance. Useful signs include: 1) Behavior after the first trimester which suggests open rejection; 2) Excessive or absent physical complaints; 3) Extreme preoccupation with physical appearance; 4) Excessive mood alterations; 5) Absence of emotional response to quickening; 6) Absence of preparatory behavior, especially during the last trimester. No single factor may in itself indicate beginning maladaptive behavior, but the appearance of a cluster of such behaviors is highly significant.

The first fourteen weeks of pregnancy is the initial period of maternal identity with pregnancy itself. If considered "high risk", the mother must realistically face and understand the problems which threaten her and the pregnancy. Before the professional intervenes he/she must realize that the woman brings with her ego strengths, ability to adapt to change, cultural and religious beliefs. It is important to stress the positive aspects of the pregnancy and her femininity. Remain optimistic, but realistic. Facing reality early serves to decrease the many fantasies the expectant mother may have. She must be helped to consider the risks, the number of hospitalizations that may be necessary, the care required, and the financial burden.

The second fourteen weeks in the high risk pregnancy will not be the quiescent period experienced in a normal pregnancy. The health team must be cognizant of the amount of concern they project to the patient, for this is directly related to the amount of anxiety experienced by the patient, and may increase her negative feelings toward the fetus. The problems must be discussed, procedures explained, and an attempt made to equilibrate interest in herself and the fetus.

During the last phase of pregnancy the "high risk" mother does not fantasize totally on how she will perform as a mother, but whether she will be a mother at all. She may even grieve away the baby in an effort to prepare herself for disaster. Usually, this is overtly displayed by lack of preparation for the baby. Recognizing these feelings and accepting them as real is an important first step in helping the mother to face the fact that the baby is real and preparations are necessary.

Consequently it may take longer after delivery for the mother to identify with and claim her infant. She must first realize that she did, in fact, complete the pregnancy and the baby is real. Initially, she looks and talks more than she touches and holds. Even though she cares for the baby, feelings of motherliness often require more time for development. Recognizing these problems, provisions for early contact between mother and baby should be made, permitting mother to go at her own rate. Providing positive experiences and praise of maternal tasks are important when the mother has delivered a compromised infant. Not only do previous feelings and experiences interfere with maternal role-taking, but also the fact that the baby is ill or premature. In many ways this mother is short changed—short changed of many days and weeks of physical and emotional preparation for the baby, not having the ideal normal baby which she had expected. She is denied the experiences of early contact both by eyes and touch, the opportunity to perform tasks associated with mothering, the taking home of her baby at the time of discharge and the normal processes of letting go, taking in, and taking hold.

The "high risk" pregnancy presents special problems and challenges in the development of the mother-infant relationship. The professional staff involved in the care should provide continual reassurance and support. Consistent, honest, day-to-day information is appreciated and demanded by the mother. Early contact is vital and she must be able to touch her baby, talk to him, see his eyes, and perform at least one maternal task for him or order to stimulate maternal claiming. Frequent visits should be encouraged. The understanding of the altered aspects in maternal role-taking by the "high risk" mother by physicians and nurses will greatly assist her to make the major adjustments that are necessary.

Bibliography available upon request.



INFERTILITY

PART I: PATHOPHYSIOLOGY AND DIAGNOSIS

TIMOTHY BURNS, M.D.

Continuing with the present issue of *Arizona Medicine* is the series of articles entitled "Seminars in Endocrinology and Metabolism." The purpose of these short review articles is twofold. First, due to the rapid proliferation of new knowledge in the field of endocrinology and the multiple tests available for their evaluation, short, clinically oriented reviews would enable the physician to keep abreast of these newer developments as they relate to their practice. In addition, with great stress being placed on voluntary recertification in many subspecialties, reviews such as they could serve as an authoritative, succinct teaching forum. The editors will endeavor to accomplish these goals by utilizing the talents of practicing physicians as guest contributors to this series. Feedback, both positive and negative, is encouraged in order to help us fulfill these objectives.

Marshall B. Block, M.D., Editor

It is estimated that 10% of couples who wish to have children are infertile and will seek medical help for this problem. Infertility may be defined as the inability to conceive during the course of normal sexual activity. It is generally held that a marriage should not be considered infertile until a year of unprotected coitus has been allowed to pass. Two basic features of the problem are (1) the multiplicity of etiological factors and (2) the equal responsibility of male and female partners.

The physicians' need for sophistication in the causes and treatment of infertility is much greater today than it was formerly. This increased need is not only due to the unavailability of babies for adoption that exists at the present time, but more importantly, is the result of what appears to be an increasing incidence of infertility. The trend nowadays is to delay marriage and subsequently to postpone having children. Many couples thus have passed the age of optimal fertility (24 to 25 years)

by the time they are ready to have children and therefore encounter problems. The increased risk of prolonged anovulation after the use of birth control pills and of adnexal infections associated with the use of intrauterine devices or occurring after therapeutic abortions are possibly additional causes for the increased incidence of infertility. Also, if the epidemic of venereal disease that has been reported is indeed in progress, a consequent rise in sterility caused by obstructive diseases of the male and female reproductive tracts can also be expected.

A brief review of the complex hormonal interactions of the reproductive tracts is necessary to appreciate the many factors which may cause infertility.

The hypothalamic-pituitary-gonadal axis is the system which stimulates and regulates the production of the hormones needed for normal sexual development and function. Both the testis in the male and the ovary in the female control and are under the control of the hypothalamus through a complex system of positive and negative feedback. The hypothalamus produces luteinizing-hormone-releasing hormone (LHRH) that stimulates the pituitary gland to produce and release two gonadotrophic hormones, follicle-stimulating hormone (FSH) and luteinizing-hormone (LH).

In the female, the action of this hormonal system is cyclic. Toward the end of the menstrual cycle, production of estrogen and progesterone by the corpus luteum decreases. As a result, the negative feedback effect exerted by estrogen on the production of FSH is diminished and FSH levels begin to rise. When estrogen levels reach their lowest point, menstruation occurs. Simultaneous with menstruation, FSH and LH levels are rising gradually. The rise of gonadotropins stimulates the growth of numerous ovarian follicles which in turn produce ever-increasing levels of estrogen in response to the rising levels of LH and FSH. Of the many follicles that begin to mature, only one normally progresses to become a mature graafian follicle; the others degenerate and eventually become atretic. The mechanism for the maturation of only one follicle is unknown. As the cycle progresses, estrogen production increases and gonadotropins, primarily FSH, become somewhat depressed as a result of negative

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Adapted from: *Clinical Symposia*, Vol. 28:5, 1976.

trogen feedback. Estrogen levels continue to rise and eventually exert a biphasic (positive) feedback on the hypothalamic-pituitary system that results in a burst of LH and a lesser burst of FSH. Approximately 24 hours later, an ovum is extruded from the mature graafian follicle. Following ovulation, the remainder of the graafian follicle begins to secrete progesterone and contributes to the production of estrogen. The augmented levels of these two hormones then sequentially transform the endometrium of the uterus into a secretory lining in preparation for pregnancy. If pregnancy does not occur, the corpus luteum, which has an inherent lifespan of approximately 14 days, will begin to decay. Progesterone and estrogen production will begin to decrease and eventually menses will ensue.

In the male, clinical evidence indicates that FSH and LH are necessary to initiate spermatogenesis through their action on the testis. Once spermatogenesis has begun, however, LH is needed for the process to continue. LH controls spermatogenesis indirectly through the action of testosterone. This hormone, which is essential for spermatogenesis, is produced by the Leydig cells of the testes in response to stimulation by LH. Testosterone also plays a major role in the development of secondary sex characteristics. When the amount of testosterone in the body reaches a certain level, it exerts a feedback influence on the pituitary gland and hypothalamus to reduce the amount of LH produced. Another testicular substance, known as inhibin (produced by the Sertoli cells) exerts a feedback influence on the hypothalamus to regulate the production of FSH.

The fertility of a couple depends on the normal interaction of a number of factors: the male must be able to produce large numbers of healthy sperm; they must not have a disease that adversely affects the male reproductive system and the sperm must be discharged at ejaculation into the anatomically normal reproductive system of the female. The sperm must penetrate the cervical mucus and ascend through the uterus to the fallopian tubes where fertilization will occur. Simultaneously, the female, who must have an intact hypothalamic-pituitary-ovarian axis, must have developed and released the ovum at the correct time. The expelled ovum must have entered the patent and freely mobile fallopian tube and must have been transported to the area in the tube where fertilization will occur. Following fertilization, the blastocyst must travel toward the endometrial cavity where nidation must take place in an endometrium which has been appropriately prepared by hormone action. The slightest defect in these basic events in either partner leads to infertility.

Other factors which directly affect fertility are the ages of the couple, the length of time that the couple has been attempting to

conceive and the frequency of intercourse. The age of maximum fertility for the male and female is approximately 25 years. After that age, fertility begins to decrease, especially in the female, in whom it declines rapidly after the age of 30.

The diagnostic investigation of the infertile couple begins with a complete history and physical examination. Because infertility is not, as commonly thought, strictly a "female problem", motivation as a couple needs to be emphasized. The couple should be encouraged to be open in their communications with each other and with the physician. Establishing a trusting relationship is essential in infertility studies because the investigation is often costly, time-consuming and emotionally trying.

The examination of the woman should, as usual, begin with a complete history. The history should include a thorough picture of her menstrual pattern, symptoms of ovulation, (e.g., *molimina*, *mittelschmerz*, increased midcycle discharge), and any apparent *hirsutism* or *galactorrhea*. Contraceptive history, circumstances surrounding a previous pregnancy loss and previous pregnancies by another partner are essential. Also to be investigated are symptoms suggestive of endometriosis, previous intra-abdominal surgeries or pelvic inflammatory disease. The couple's sexual history should be established in terms of frequency of coitus and coital technique. The use of artificial lubrication, various massage oils and post-coital douching should be discouraged because they may kill sperm. Medications that may impair fertility, (e.g. phenothiazines producing an *amenorrhea-galactorrhea* complex), should be inquired about and discontinued if possible. The physical examination should include an assessment of the woman's general health and her physical ability to tolerate the hoped-for pregnancy. Special attention should be paid to endocrine and reproductive features. Specifically, findings of thyroid disease, increased intracranial pressure (especially in *oligomenorrheal* or *amenorrheal* women), *galactorrhea*, abnormal hair distribution or *clitoralmegaly* should be noted. A thorough pelvic examination is mandatory to delineate congenital anomalies or tumors.

The examination of the male should also begin with a complete history. The following categories should be covered: Age; occupation; medical, surgical, urologic and developmental histories; sexual technique; exposure to toxins; irradiation; medications; and personal habits. The aforementioned may reveal exposure of the scrotum to excess heat, (e.g., as is common in cross-country truck drivers), history of mumps after adolescence or accident damage to the testes from previous cryptorchid or hernia repairs. Previous history of VD, orchitis, epididymitis and medication use (e.g., antihypertensives and tranquilizers) should be investigated. It is also important to note whether the patient has fathered

other children with a previous sexual partner. Finally, the patient should be questioned about pertinent personal habits such as alcohol consumption, the kind of underwear worn (tight underwear may raise scrotal temperature) and bathing habits (hot baths and saunas may also injure sperm).

A complete physical examination of the male should be performed with emphasis on endocrine and urological factors: Abnormal hair patterns, *gynecomastia*, visual field defects, decreased smell and thorough genital examination. Important to note is the penis size, location of the urethral meatus, presence or absence of *phimosis*, the size and consistency of each testis, *vas deferens*, *epididymis*, and presence of *varicocele*. Rectal examination should be performed to determine the size and consistency of the prostate and seminal vesicles. Also, the prostate should be massaged and the expressed fluid examined for white cells.

There are five basic infertility screening procedures which will define the general area or areas in which problems exist. These are:

1. Basal body temperature recordings which are used for detecting ovulation and for timing intercourse. Temperature recordings may also detect a luteal phase deficiency. If pregnancy occurs, the level of progesterone does not drop, the temperature remains elevated and the menses do not occur.

2. Further evaluation of ovulatory function is required even though basal body temperature may suggest that ovulation has occurred. A secretory endometrium obtained by biopsy is further presumptive evidence of ovulation. Plasma progesterone concentration offers a noninvasive measure of ovulation. A plasma progesterone concentration of 3 mg./ml. or greater suggests ovulation.

3. The semen analysis is the most important initial diagnostic study of the male and, if it is normal, further investigation of the male can be stopped temporarily. Optimum results are obtained after two days of abstinence. The semen analysis can provide information about sperm mobility and morphology as well as the absolute number of sperm present. As the sperm number, semen volume and percentages of normal and motile forms decrease, the ability to impregnate decreases.

4. Tubal patency is confirmed with either tubal insufflation with carbon dioxide (Rubin's test) or hysterosalpingography. The hysterosalpingogram is preferred, in that it not only provides information about tubal patency, but also reveals distortion of the endometrial cavity such as that caused by uterine anomalies, fibromyomas and *synechiae*. In addition, if the dye remains confined to the areas adjacent to the fimbriae of the tubes, peritubal adhesions may be suspected. Hysterosalpingography

may also have a therapeutic effect. Pregnancy is frequently achieved within the first three cycles following the test. This effect may be the result of flushing of debris, breaking of adhesions or induction of peristalsis.

5. The post-coital examination (Sims-Huhner test) is performed one to two days prior to the expected date of ovulation. The couple is asked to have intercourse two to four hours prior to being seen. The examination consists of evaluating the

cervical mucus and the number and motility of sperm present in the endocervix. The mucus should be examined for ferning and spinnbarkeit, both of which increase the time of ovulation and increase the rate of sperm survival.



*Seminars in
Chest Medicine*

DRUG-INDUCED LUPUS ERYTHEMATOSUS

WILLIS A. WARNER, M.D.

This continuing series of articles entitled "Seminars in Chest Medicine" will attempt to keep the reader abreast of developments in the broad field of pulmonary diseases. The format used will be that of brief succinct reviews written by the editors as well as guest contributors. Areas of controversy as well as practical chest medicine will be explored. We hope that these reviews will be of value in promoting continuing education for certification examinations as well as a forum for new and controversial issues. The editors welcome comments and discussion from our readers.

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In 1954, hydralazine was first linked to drug-induced systemic lupus erythematosus (SLE).^{1,2,3} Each year the list of implicated drugs grows longer (see Table I). Evidence for incrimination of many of these drugs is sketchy, indeed, some drugs on the list may not belong there.

Lee and Chase reviewed all indicated drugs and attempted to assign a relative degree of associated risk. Hydralazine, procainamide, practolol and D-penicillamine were considered to be high risk drugs. Drugs of moderate capability included isoniazid, diphenylhydantoin, the thiouracils, and trimethadione. The same authors felt that sulfonamides and oral contraceptives have been falsely accused.⁴

Numerous clinical studies attest to the hazards of highrisk drugs. In one hydralazine-treated series, for example, the anti-nuclear antibody (ANA) test was positive in 27% of patients, and 12% of all treated patients developed SLE.⁵ In another group of patients treated with procainamide, 83% developed a positive ANA titer, and 29% of these exhibited clinical evidence of SLE.⁶ Thus it can be seen that this poorly understood phenomenon poses a potentially serious problem in medical therapeutics.

Criteria for diagnosis of drug-induced SLE are the same as those for spontaneous SLE.^{4,7} Clinical manifestations include fever, arthralgias, myalgias, pleuritis, pleural effusion, pericarditis, anemia, and all other recognized manifestations of SLE. The following case report illustrates a fairly typical complication of procainamide therapy.

CASE REPORT

B.F., a 67-year-old retired Caucasian male, had noted vague aching anterior chest pains for approximately two months prior to the initial examination. He stated that the pain was accentuated by recumbency and deep inspiration. The patient had known rheumatic heart disease and had experienced lifelong recurrent arthralgias, for which he took aspirin frequently. Other medications included digoxin 0.25 mg daily and procainamide 375 mg, q.i.d.; the latter had been initiated three months earlier for control of ventricular premature contractions. He was a nonsmoker. He had dyspnea with exertion but not at rest. There was no associated history of cough, fever, hemoptysis, orthopnea, or pedal edema.

Positive physical findings were limited to the thorax. Borderline cardiomegaly was present, with the left border of cardiac dullness in the sixth interspace, one centimeter lateral to the midclavicular line. Rhythm was normal sinus with occasional premature ventricular contractions. There was a grade 3/6 holosystolic murmur audible at the apex. The blood pressure was 140/80. Neither pleural nor pericardial friction rubs were discernable. The lungs were clear to auscultation and percussion.

A chest roentgenogram showed only borderline cardiomegaly. No parenchymal or pleural densities were present.

Supporting evidence for drug-induced pleuritis and pericarditis was provided by initial laboratory studies. The erythrocyte sedimentation rate (ESR) was 80 mm/hr. (Westergren). An LE preparation was positive. Both the ANA and the rheumatoid

Table 1

Drugs Implicated in Systemic Lupus Erythematosus

Procainamide	Guanoxan
Hydralazine	Isoquinazepan
Penicillin	Quinidine
Sulfonamides	Diphenylhydantoin
Tetracycline	Mephenytoin
Streptomycin	Trimethadione
Aminosalicylic acid	Primidone
Griseofulvin	Ethosuximide
Phenylbutazone	Nitrofurantoin
Methyl Thiouracil	Phenobarbital
Propyl Thiouracil	Practolol
Reserpine	Chlorpromazine
Methyldopa	Isoniazid
Oral Contraceptives	

(latex) factor were positive; titers were not determined. Serum digoxin level was less than 0.5 mg/ml.

Initial therapy of indomethacin 25 mg t.i.d. proved inadequate. Despite cessation of procainamide, the patient noted progression of anterior chest pain with extension into the neck two weeks later. Prednisone 20 mg/day, was begun at that time and prompt relief of symptoms followed. Steroids were tapered and discontinued within six weeks.

The ESR declined rapidly with initiation of steroid therapy; it dropped to 4 mm at the time steroids were discontinued. The LE preparation was then still positive, but reverted to negative two months later. The ANA remained positive for approximately four months following procainamide withdrawal, after which time it, too, became negative.

Approximately three months after steroids were stopped, there was a transient exacerbation. The patient experienced fever, increased pleuritic chest pain and arthralgias for one week. The ESR increased to 53 mm per hour and the ANA remained positive (1:160). With resumption of indomethacin therapy (50 mg t.i.d.), an excellent response was noted. The indomethacin was discontinued approximately one month later.

The patient has since remained asymptomatic except for previously noted arthralgias. Most recent laboratory studies showed a normal hemogram, ESR 25 mm/hr and positive ANA (1:40). At no time did the chest roentgenogram show evidence of pleural effusion or parenchymal infiltrate.

Pulmonary sequelae associated with drug-induced SLE include pleural thick-

ing, pleural effusion, diffuse interstitial pneumonitis, migratory pneumonitis, segmental atelectasis, elevated diaphragm and pulmonary fibrosis.^{8,9,10}

Procainamide appears to have a special predilection towards pulmonary manifestations of drug-induced lupus. Harpey reported pleuro-pulmonary manifestations in 30% of procainamide-induced SLE patients.⁹

Fries and Holman believe pleurisy to be a forerunner of active SLE and a harbinger of potential renal disease.¹⁰ Whether this finding applies to drug-induced SLE is not known.

Controversy exists regarding renal manifestations of drug-induced lupus. Most authors feel that drug-induced lupus "spares the kidney".^{4,10} Alarcon-Segovia, however, observed evidence of renal complications in 20% of hydralazine-induced lupus.¹¹ Renal biopsies obtained from a group of patients not exhibiting urinary sediment abnormalities showed definite although mild glomerular changes.¹⁰

It has been speculated that potential renal complications do not have adequate time to develop in most patients, because the offending drug is stopped relatively early in the course of the disease. Serum complement levels, however, tend to be normal in drug-induced SLE and antibody to deoxyribonucleic acid (DNA) is exceptional, two observations associated with renal pathology in spontaneous SLE.^{9,10}

It is generally believed that drug-induced SLE is a more benign disease than spontaneous SLE. Fatalities are rare. Improvement usually follows cessation of the offending drug and is an important diagnostic consideration.⁴ Signs and symptoms of disease may persist for many years following drug cessation, however.¹⁰ Some patients require steroidal or other anti-inflammatory drug support for relief of symptoms.

Unlike spontaneous SLE, there does not appear to be a definite sex predilection. Patients with drug-induced syndromes tend to be considerably older than those with spontaneous SLE. Undoubtedly, this reflects the fact that most patients taking implicated drugs are in older age groups.⁴ Minimal doses of a drug administration may lead to the development of drug-induced lupus. As little as 500 mg procainamide/day has been associated with the clinically recognized syndrome. Duration of drug therapy also can be short; manifestations have been observed after as few as two to three weeks.⁴

In long-term studies of patients taking procainamide and hydralazine, serologic positivity always precedes clinical illness. These observations have strengthened the case for an immunologic basis for this disease.

For practical purposes, a negative ANA excludes the diagnosis of drug-induced SLE. Following cessation of drug admin-

istration, the ANA may either revert to negative or remain positive for years.^{4,5,10}

The laboratory diagnosis of drug-induced SLE is essentially the same as that of spontaneous SLE. The LE preparation may be positive, depending on the stage of the illness. The ESR is usually, but not invariably, elevated; it generally parallels the clinical course of the disease.

Proteinuria, elevated creatinine and other manifestations of renal disease are not observed in most patients. As mentioned previously, this may result from actual renal sparing or simply reflect early detection of the disease before kidneys are seriously damaged.

Hematologic abnormalities include leukopenia, anemia, and thrombocytopenia; these and other laboratory findings are summarized in the excellent monograph by Fries and Holman.¹⁰

Because serologic testing remains the foundation of clinical diagnosis, a better understanding of these examinations is essential for differentiation of this disease. Fluorescent ANA, antibody to native DNA and extractable nuclear antigen (ENA) provide this information.

Nucleoproteins derived from dying cells give rise to antinuclear antibodies which are measured by a fluorescent technique. Four patterns of fluorescence have been observed: (1) peripheral (or ring), (2) homogenous (or diffuse), (3) speckled (or reticular) and (4) nucleolar. More than one pattern may be exhibited in some sera. Both the titer and the associated pattern should be reported; they help to differentiate the various types of collagen disease. The diffuse pattern of fluorescence, for example, is most commonly seen in SLE and rheumatoid arthritis. The speckled pattern is commonly observed in scleroderma and the mixed connective tissue disease syndrome.¹⁰

It should be mentioned, however, that fluorescent ANA titer does *not* correlate with clinical activity in SLE. Clinical remission has been observed in the presence of continuing high fluorescent ANA titers.

More esoteric serologic tests are on the clinical horizon. These include detection of antibodies to double stranded (native) DNA and extractable nuclear antigen (ENA).

Some investigators feel that antibody to native DNA is a *sine qua non* for SLE, because there appears to be good correlation with its presence and spontaneous SLE. It is rarely observed in drug-induced SLE.¹⁰ Earlier reports indicated antibody to DNA was common in hydralazine-induced SLE, but these studies have been criticized. In summary, antibody to DNA may represent a useful means of distinguishing between spontaneous SLE and drug-induced SLE. Antibody to native DNA appears to possess considerable prognostic value, unlike fluorescent ANA.¹⁰

Detection of antibody to extractable

nuclear antigen (ENA) is not widely available. It, too, may be of value in delineating drug-induced SLE from spontaneous SLE. In a comparison of these two groups by Fries and Holman, drug-induced SLE patients had little antibody to ENA whereas spontaneous SLE patients had significantly higher titers.¹⁰ The clinical applicability of this differentiation is uncertain.

Serum complement is another means for assessing the status of SLE; it appears to have both diagnostic and prognostic value. Low complement levels are associated with exacerbation of disease, particularly renal manifestations. It is postulated that serum complement is consumed in the production of immune complexes. Serum complement values tend to remain normal in drug-induced SLE, perhaps corroborating the more benign clinical course of this disease.^{7,10}

Many investigators have attempted unsuccessfully to define the pathogenesis of SLE. Most have sought an immunologic basis because of the widely recognized serologic abnormalities preceding the onset of clinical disease.

Early studies with hydralazine and isoniazid implicated acetylation of these drugs as a possible etiologic factor in the genesis of drug-induced SLE.⁶ Two groups of patients were identified; slow acetylators and rapid acetylators. Most of the drug-induced SLE cases were observed to fall in the slow acetylation group. This led to a recommendation that patients receiving these drugs be screened according to vulnerability based upon their capacity for drug acetylation. Many drugs associated with drug-induced SLE do not undergo acetylation, however. Procainamide, frequently implicated in drug-induced SLE, is excreted mostly unchanged while smaller amounts are hydrolyzed and excreted as para-amino benzoic acid.⁴ Antibodies to procainamide have been detected, but only 6% of patients with procainamide-induced SLE showed such antibodies.¹²

The formation of complexes between certain drugs and DNA has led to the hypothesis that this may be part of underlying immunologic mechanism in drug-induced SLE. In vitro, procainamide binds to DNA, in the presence of a photodynamic molecule and visible light.⁴ This complex has been shown to have antigenic properties in experimental animals.

Rafty and Denman⁴ linked the beta-blocking agent practolol to drug-induced SLE in three patients. They postulated that practolol may selectively inactivate T-lymphocyte populations which normally control the emergence of lymphocytes with autoimmune propensities and thus trigger the SLE syndrome. DNA antibodies were not found in their series. Serum complement was within normal limits. Lymphocyte transformation was not demonstrated

but lymphocytes from all three patients responded abnormally to mitogens in vitro.¹³

Various authors have postulated a "lupus diathesis" but evidence for this has never been very convincing.^{4,5,9,10,14} Obviously, much needs to be learned about the immunogenesis of SLE before such entities can be established with confidence.

SUMMARY

A case of drug-induced lupus erythematosus associated with procainamide therapy was presented for illustrative purposes. The administration of procainamide alone

is associated with positive fluorescent antinuclear antibodies in more than 50% of patients. Most of these never develop clinical sequelae. Nevertheless, procainamide, hydralazine, and anti-convulsants appear to be frequent causes of drug-induced SLE. The pathogenetic mechanism appears to be immunologic in nature but has not yet been defined precisely.

Any patient with pleuritis, pericarditis, arthralgias, and fever, who is taking procainamide or other implicated drugs, should have drug-induced SLE considered in the differential diagnosis.

1. Dustan, HP, Taylor RD, Corcoran, AC, and Page, R. Rheumatic and Febrile Syndrome During Prolonged Hydralazine Treatment. *JAMA* 154:23, 1954.

2. Reinhardt, DJ and Waldron, JM: Lupus Erythematosus-like Syndrome Complicating Hydralazine (Aprotin) Therapy. *JAMA* 155: 1491, 1954.

3. Shackman, NH, Swiller, AI, and Morrison, R. Syndrome Simulating Acute Disseminated Lupus Erythematosus. *JAMA* 155: 1492, 1954.

4. Lee, SL and Chase, PH: Drug-Induced Lupus Erythematosus: A Critical Review. *Semin. Arth. and Rheum.* 5: 1975.

5. Blomgren, SE: Drug-Induced Lupus Erythematosus. *Seminars in Hematology* 10:345, 1973.

Additional bibliography available upon request.

DIABETES MELLITUS AND THE GASTROINTESTINAL TRACT

Part II

Small and Large Intestine and Gallbladder

STEPHEN GLOUBERMAN, M.D.

**Seminars in
Gastroenterology
and Liver Disease**

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SMALL INTESTINE

Diabetics have a higher intestinal absorptive rate of glucose by up to twofold. Diabetic animals absorb more amino acids than normal controls. This is not related to the presence of insulin. Intestinal analyses for sucrase, maltase, and lactase are normal.¹⁵ The reason for the increased absorption is unknown.

Diabetic patients have a decreased incidence of duodenal ulcer, and this may be related to their decreased acid secretion. Complications of duodenal ulcer, however, are more frequent in diabetics. The incidence of gastric ulcer is the same as in controls.

Diarrhea is a complication affecting a small number of patients with diabetes. It has been reported from as low as 0.001% to 7%. Of 300 diabetics who had GI complaints, 33 had diarrhea, 14 were found to have normal stool fat, 19 steatorrhea. One of these 19 had total villous atrophy on jejunal biopsy, the remainder were normal.¹

The diarrhea is usually brown, watery, voluminous and may be associated with tenesmus.¹⁶ It can occur either during the day or at night, but at night may present as incontinence. The typical patient is more often male than female (the reverse of the

incidence of diabetes per se), aged 25-40, has had diabetes for ten years or more, with poor control for several years. He is of normal weight or obese and has other evidence of visceral and peripheral neuropathy. Borborygmus may be prominent. Most are impotent. The diarrhea is episodic with bouts lasting days to weeks, during which time weight loss occurs to be followed by an interval of weeks to months of normal bowel habits or constipation, during which the weight loss is regained. These episodes recur periodically, are often associated with emotional upset, but tend to become less severe as time proceeds. The diarrhea is often precipitated by eating.

The etiology is unclear. Most have normal exocrine pancreatic function as determined by a secretin test, normal electrolyte and d-xylose absorption and vitamin B₁₂ levels. Serum carotene is normal or elevated. Of those patients without steatorrhea, small bowel histology is normal. Occasionally a mild lymphocytic infiltrate is present in the lamina propria. About 50% of patients with diarrhea have steatorrhea and their jejunal biopsies are usually normal, suggesting that the difference between these patients and those without steatorrhea is one of degree, rather than of pathogenesis. These patients have normal Schilling tests. Gastric analysis is

not different from diabetics without diarrhea. Intestinal transit time may be either rapid or delayed, but is usually slow. Small bowel series is abnormal in 25% of patients. Mucosal swelling with coarse folds, segmentation and variation in luminal caliber can be present. Gastric emptying may be delayed. Intestinal perfusion studies have revealed impaired water absorption in the distal small bowel.¹⁷

Abnormal bacterial cultures are found in less than 20% of patients. *E. coli*, enterococci, aerobacter and staphylococci may be found at concentrations of 10⁷ / ml., and a few patients have bacterial overgrowth throughout the stomach as well.¹⁸ In patients with slow transit this behaves like a blind loop. Bile salt deconjugation may play a role. Those patients with bacterial overgrowth generally respond to antibiotics, those without do not. They do not respond to pancreatic extracts, anticholinergics or steroids. Control of the diabetes and use of cholinergic therapy may benefit the diarrhea in a small percentage.

A small group of patients with diarrhea are thin, show marked weight loss, have steatorrhea, and usually well controlled diabetes. Their jejunal biopsies are flat, and they show an excellent response to glutamine withdrawal or steroids. They are consi-

d to have adult celiac disease.¹⁹ The incidence of the two diseases occurring together is 4-5 times greater than would be expected by chance alone, but one series of patients with sprue failed to show a single case of diabetes. So, whether the two diseases occur more frequently together, or whether there is coincidence in their appearance remains to be resolved. As the malabsorption improves with therapy, the protein requirement often increases. In summary, diarrhea without steatorrhea requires supportive therapy. If bacterial overgrowth is demonstrated, antibiotics may be beneficial. If steatorrhea is present, a jejunal biopsy should be done. If it shows villous atrophy, gluten restriction should be instituted.

LARGE INTESTINE

Constipation is a frequent complaint among diabetics, and may be the only one. It is usually seen in patients with neuropathy peripherally, and the barium enema may reveal a dilated colon filled with stool. Pericolic ulcers may develop. Studies of the anal sphincter reveal normal tone and strength. It has been postulated that afferent impulses from the cecum and the rectum are defective and that these may be involved in the constipation and the nocturnal incontinence.

GALLBLADDER

Several large series of autopsied patients have shown a higher incidence of gall-

stones in diabetics than in non-diabetics by a factor of 1 1/2 to 2. Representative figures are 31% vs. 21% and 39% vs. 22%.¹ This has not been verified by other studies, and patients with proven gallstones are not found to have a higher incidence of diabetes than patients without stones.

The gallbladders of diabetics tend to be larger in size than those of non-diabetics.²⁰ They contract less vigorously, as shown by measuring the size of the gallbladder on x-ray before and after a fatty meal. Vagal neuropathy has been proposed as a mechanism for this.

Acute cholecystitis carries a poor prognosis in the diabetic, with a 22% mortality and a 51% mortality rate from emergency surgery. Failure to localize the infection, and the occurrence of emphysematous cholecystitis with organisms such as *Cl. Welchii* and occasionally, *E. coli*, are two possible mechanisms. Twenty per cent of diabetics with acute cholecystitis have perforation of the gallbladder or it is gangrenous. Elective surgery carries no greater morbidity and mortality for diabetics than non-diabetics, and this is recommended for any diabetic with proven gallstones. Some have suggested yearly cholecystograms as an aid in detecting gallstones.

ETIOLOGY

The cause of these gastrointestinal manifestations is unknown. Most authors attribute visceral neuropathy as being respons-

ible, yet the evidence is mostly by analogy. The gastric and gallbladder changes of the diabetic are similar to those of patients who have had a vagotomy, yet numerous biopsy and autopsy studies have failed to show any abnormalities in Meissner's and Auerbach's plexi. The brain, vagal motor nuclei, and cervical vagus nerves are also normal. Giant sympathetic neurons are found in the pre- and paravertebral ganglia.²¹ Swelling of dendrites of postganglionic neurons within dendritic glomeruli are seen in pre- and paravertebral ganglia at a much higher frequency in diabetics. This is the first described finding of a potential neuroanatomic correlate to the GI dysfunction. However, denervation hypersensitivity to Mecholyl is not found, and the response to bethanechol is variable and usually ineffective. The diabetic with diarrhea tends to improve with time, suggesting that a progressive neurologic degeneration is not a major pathophysiologic factor in this group.

A second possible etiologic factor is diabetic micro-angiopathy.²² The histologic appearance of blood vessels from biopsies at any level of the GI tract, however, is not different in diabetics than controls. At autopsy, atherosclerotic changes may be more prominent in diabetics, but a pre-terminal acceleration of lipid deposits in the vascular wall has been suggested for this observation, as no difference is seen in biopsies taken during life from diabetics and controls.



Radiology Case of the Month

CASE NO. 20

HAROLD TRIEF, M.D.
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Figure 1 and 2

PA and lateral admission chest radiographs

The patient is a sixty-one year old male who had noted dyspnea on exertion, night sweats and slight dysphagia for several weeks previous to admission. Physical exam revealed a nodular thyroid, plethoric facies and distended neck veins. Chest radiographs showed the above abnormality (Figs. 1 and 2). A radionuclide superior vena cavagram was positive for SVC obstruction. Barium swallow and tomograms confirmed extrinsic pressure on the trachea and esophagus (Figs. 3 and 4). A radionuclide thyroid scan was consistent with multinodular goiter and showed slight uptake below the suprasternal notch suggestive of substernal extension of thyroid. Could thyroid pathology alone be responsible for the etiology of the patient's problem?

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MULTINODULAR GOITER WITH SUBSTERNAL COMPONENT CAUSING SUPERIOR VENA CAVA OBSTRUCTION



Figure 3
Barium Swallow

Mediastinoscopy and biopsy indeed confirmed the existence of a substernal goiter. The patient was treated with 30 millicuries of radioactive iodine and his symptomatology showed progressive improvement.

Substernal or intrathoracic goiter as described by DeGroot and Stanbury is a "pronounced prolongation of the lower pole or downward growth of the nodule from a lower pole, below the level of the top of the manubrial notch." It is considered an acquired, not embryologic abnormality with substernal thyroids being reported as low as the diaphragm. Typically it is found in older individuals who have a higher incidence of kyphosis, stooped posture and increased anterior-posterior chest diameter.

Symptoms are generally due to mechanical factors. Characteristically dyspnea may be produced by changes in head position. Also frequently associated mild dysphagia of an insidious nature has been reported. On physical exam some patients present with prominent dilated veins ac-



Figure 4
10 cm tomogram

cross the chest presumably secondary to minor venous obstruction but SVC obstruction is a rare complication.

Lesavoy reported that SVC obstruction was caused by neoplasma at least 85 to 90% of the time. Mahajan reported 16 cases due to benign causes with two secondary to substernal thyroids. Other more common causes include:

1. Aneurysm of aorta or great arteries
2. lymphadenopathy
3. mediastinal fibrosis (histoplasmosis, irradiation, idiopathic)

Other more uncommon causes include:

1. mediastinal emphysema, severe
2. pericarditis, severe
3. thrombosis of the superior vena cava

Sparagna reported a similar case to ours in which the patient went to necropsy. A retrosternal thyroid was found causing extrinsic pressure on the jugular and superior vena cava without evidence of thrombosis. Retrosternal thyroid should be considered when a patient presents with a superior mediastinal mass and SVC syndrome, especially since it is a curable condition.

1. Mikkelsen, W.J.: Varices of the Upper Esophagus in Superior Vena Caval Obstruction. *Radiology* 81:945-948, 1963.

GUIDELINES FOR THE MANAGEMENT OF LUNG CANCER

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INTRODUCTION

In 1912, Adler reported on the world experience with bronchogenic carcinoma. The total number of cases at that time was 374. By 1956 cancer of the lung accounted for 29,000 deaths in the United States alone. This figure had nearly doubled by 1966 and the projection of the American Cancer Society is for 85,000 deaths due to lung cancer in 1980. Even allowing for greater efficiency in case finding and diagnosis, and taking into account increasing populations and increasing proportion of the population in high risk categories, these figures indicate an epidemic of alarming proportions.

While diagnostic accuracy and efficiency have steadily improved through the year, therapeutic techniques have unfortunately not kept pace. The overall 5-year survival rates of 5-10% reported in the 1940's and 1950's have changed little up to the present time. While radiotherapy, chemotherapy and more recently immunotherapy have provided significant gains in prolonging useful life, relieving disabling symptoms and occasionally providing for long term survival, surgical resection remains the only therapeutic modality which consistently offers the opportunity for long term survival in carefully selected patients.

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In the fall of 1976 a medical audit of all cases of bronchogenic carcinoma seen at the TVAH in 1974 revealed that 17% of all patients had delays of more than two months from the date of the first detected abnormality on chest x-ray to the time of diagnosis. In addition 17 of 35 patients were judged by the audit committee to have had inadequate preoperative evaluation. In 6 patients this resulted in attempted surgical resection when more thorough evaluation would have very likely revealed evidence of non-resectability. It was felt that the approach taken to diagnosis and staging of lung cancer suspects was, at times, without clear direction, organization and goals.

We feel that for patients suspected of having carcinoma of the lung an organized, methodical approach to diagnosis, preoperative evaluation and treatment will provide significant advantages to the patient. A systematic approach should promote diagnostic efficiency, staging accuracy and provide the best information for the selection of the most appropriate mode of therapy in the individual patient. Most importantly, it should allow the gathering of this information with the least delay and the greatest accuracy at the least risk, discomfort, and expense to the patient. Here is such an approach. (Figure 1.)

DIAGNOSIS

The investigation of a patient with suspected carcinoma of the lung should begin with a careful, detailed history and physical examination. The history of tobacco smoking, as well as of industrial or environmental exposure to other potential carcinogens, should be elicited. The nature and duration of respiratory symptoms particularly cough, hemoptysis, chest pain and dyspnea can provide information useful in diagnosis and in assessing prognosis. Hoarseness, weight loss, extra-thoracic pain or neurological symptoms may indicate the presence of disseminated disease. Prior history of lung disease, pulmonary infection or thoracic surgery may suggest the possibility of alternative diagnoses:

Physical examination of the head and neck may reveal Horner's syndrome associated with a superior sulcus tumor, superior vena caval obstruction or signs of central nervous system involvement by tumor. The thorax should be examined for signs of obstructive atelectasis, localized wheezing, evidence of pleural effusion, or tenderness suggesting chest wall or rib invasion. Palpable lymphadenopathy, particularly in the supraclavicular or axillary regions, and hepatomegaly suggest extra-thoracic extension as well as provide easily accessible sources of potentially diagnostic tissue. The extremities should be examined for cyanosis, clubbing or cutaneous metastases. Clinical analysis of the peripheral blood

may aid particularly in the diagnosis of extra-thoracic disease. Elevation of alkaline phosphatase and SGOT suggests possible liver metastasis. Alkaline phosphatase may be increased also in the presence of skeletal metastasis. Hypercalcemia and hypophosphatemia may herald bony lesions. Electrolyte abnormalities suggest the possibility of ectopic hormone production by the tumor, for instance, hyperadrenocorticism or the syndrome of inappropriate anti-diuretic hormone. (Such extra-pulmonary manifestations of lung cancer as ectopic hormone production and hypertrophic pulmonary osteoarthropathy do not indicate dissemination and do not of themselves preclude resection.)

Skin tests for delayed hypersensitivity to PPD, histoplasmin, and particularly in areas endemic for coccidioidomycosis, coccidioidin and spherulin are helpful in evaluating possible infectious etiologies for the observed abnormalities. Serologic tests for coccidioidomycosis would be helpful in the same regard.

Sputum examination for the presence of microorganisms, including bacteria, mycobacteria and fungi, offer more concrete support for an active infectious process than the above mentioned dermal and serological tests. Cytologic examination of coughed early morning sputum on 3 consecutive days provides a diagnosis of malignancy in up to 70-75% of cases. An accurate histologic diagnosis can be made in as many as 80% of these. While this procedure is rapid, painless, poses no risk to the patient, and provides a reasonable diagnostic yield, cytologic diagnosis is time consuming, requires a competent cytopathologist, and fails to allow histologic characterization in significant numbers of cases. Therefore, where at all possible histologic confirmation of a cytologic diagnosis of cancer should be obtained.

The chest radiograph is a very sensitive instrument in the diagnosis of lung cancer. Patients with significant symptoms due to lung cancer only rarely present with negative chest x-rays. On the other hand, the chest radiograph is usually nonspecific and of only modest value in differential diagnosis. Certain radiographic presentations such as an opacified hemithorax with pleural fluid and ipsilateral mediastinal shift are nearly pathognomonic of bronchogenic carcinoma, but other presentations, such as the solitary pulmonary nodule, are seldom distinctive enough to allow such certainty.

Examination of previous x-rays can provide a wealth of information. Lesions which may be partially obscured by hilar structures become much more evident when the configuration of the normal hilum is observed. A pulmonary nodule which can be confirmed to have been present and unchanged for two years or more is unlikely to be malignant.

Tomography can better define the nature and extent of lung shadows. The margins of a lesion, the presence of satellite lesions, and the presence and nature of calcification can be of great value in assessing these lesions. Tomography of the mediastinum can be an important aid in evaluating the extension to regional lymph nodes. James and Ellwood report a 76% correlation of positive mediastinoscopy with abnormal tomography; more importantly, mediastinal biopsy was negative in 95% of those with negative tomograms.

Bronchography may provide useful information in selected cases. Infiltrative-appearing lesions pose particular problems in interpretation and the bronchographic appearance can be especially helpful in this circumstance.

Following the initial investigation and radiographic evaluation, efforts are directed toward obtaining tissue confirmation and histologic classification of the diagnosis.

Bronchoscopy can provide access to diagnostic material and information regarding thoracic extension of disease in a significant number of patients. Rigid bronchoscopy can provide tissue confirmation of bronchogenic carcinoma in up to 50% of cases and the addition of bronchial aspiration and postbronchoscopy sputum cytology can add to that number. However, the fact that up to 65% of tumors arise in the upper lobes, which are relatively inaccessible, limits the diagnostic potential of rigid bronchoscopy. The development of the flexible fiberoptic bronchoscope has extended the visual range of the bronchoscopist to include the upper lobes as well as segmental and subsegmental levels of the middle and lower lobes. When combined with bronchoscopic brush biopsy and transbronchial biopsy under fluoroscopic guidance, diagnostic accuracy in lung cancer as high as 92% has been reported. Additionally, visualization of the vocal cords, trachea, and examination of the carina and of carinal mobility provides important information regarding resectability.

Biopsy of palpable lymph nodes in the supraclavicular or axillary areas can provide tissue for diagnosis and histologic classification in a significant number of patients. Biopsy of scalene lymph nodes in the absence of palpable lesions provides diagnostic material in fewer than 10-20% of cases and is rarely indicated. Mediastinoscopy, particularly in patients with radiographic evidence of mediastinal involvement, is also a useful technique. Indications for and yields from mediastinoscopy will be discussed in a later section.

In carefully selected individuals, percutaneous lung biopsy, either by aspiration or tissue core techniques, has a high diagnostic yield. Complications include pneumothorax in up to 30%, of which approximately one third will require chest

GUIDELINES FOR THE MANAGEMENT OF
LUNG CANCER

I. Diagnosis

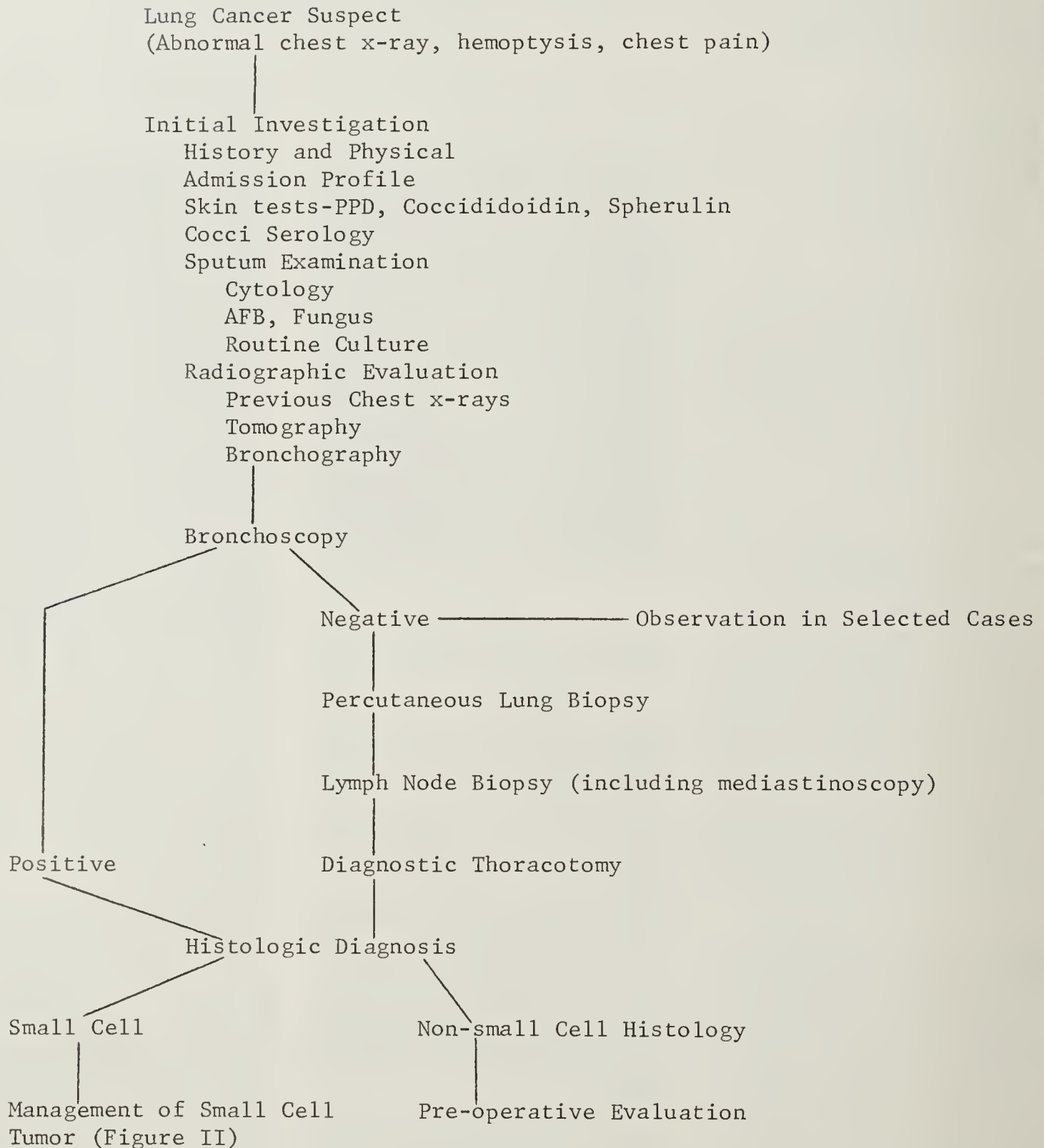


Figure I - a

II. Pre-operative Evaluation

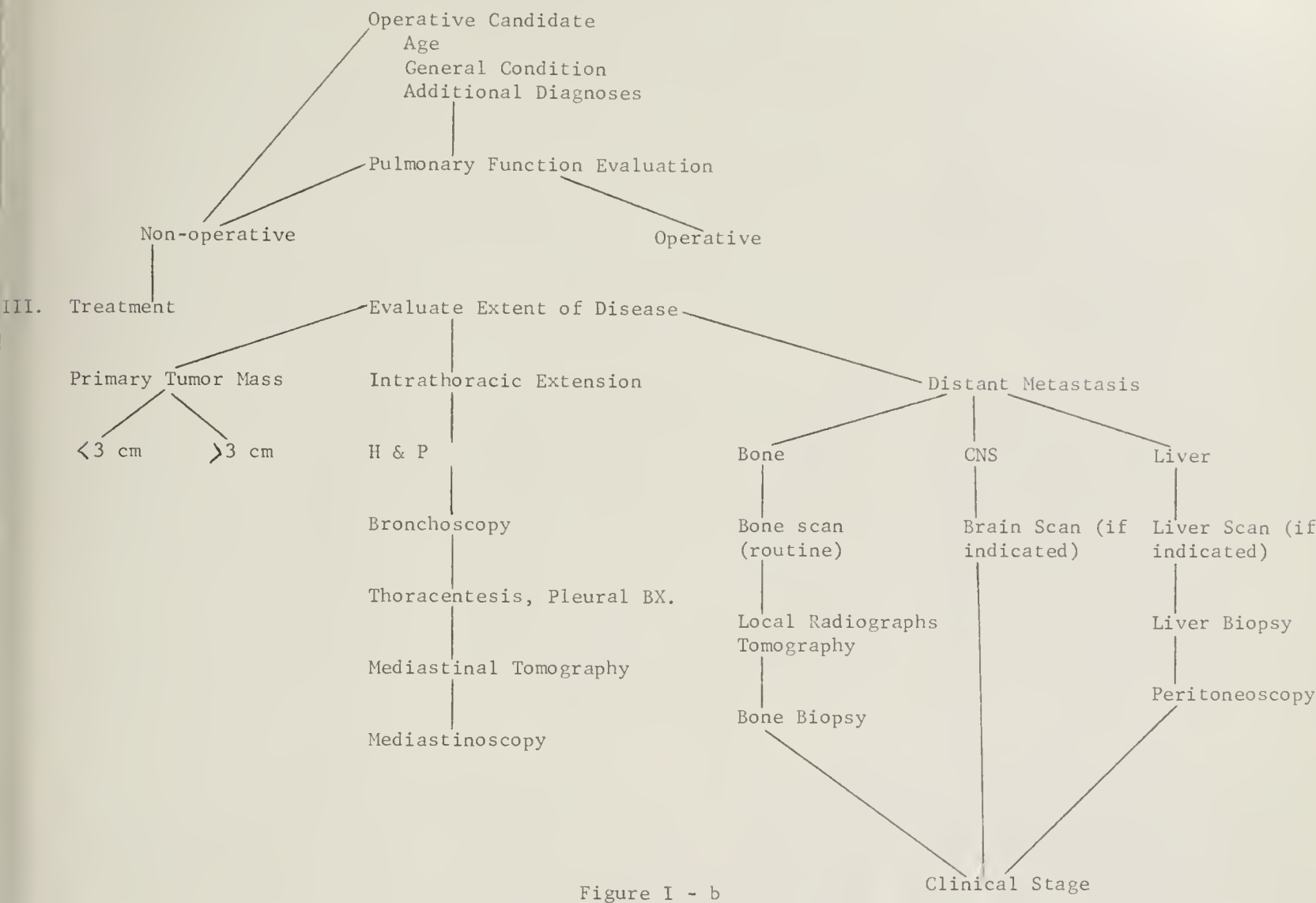


Figure I - b

ube therapy, and hemoptysis in 10%, usually of a self-limited nature but potentially fatal. In rare instances implantation of tumor along the needle track has also been reported. Enthusiasm for these procedures should be tempered by the realization that non-specific or negative biopsies are of limited significance and that positive biopsies usually result in therapeutic thoracotomies. However, in patients for whom thoracotomy is contraindicated, either because of excessive operative risk or because of evidence of widespread disease, percutaneous biopsy may be the best available source of diagnostic tissue. Bone or bone marrow biopsy, thoracentesis and pleural biopsy, liver biopsy, or biopsy of cutaneous metastases in selected individuals may also yield diagnostic material. Rarely, tissue obtained from cranial metastases can be the source of a diagnosis of lung cancer.

Utilizing the above techniques, it is possible to make a positive diagnosis of lung cancer as much as 95% of the time, but the persistence required to do so may have an unfavorable cost-benefit ratio in a given case. Diagnostic delay, added risk, discomfort and expense to the patient as well as the likelihood of subsequent surgery

anyway may cause these procedures to be bypassed and thoractomy performed earlier in the course.

In selected instances thoractomy may be delayed and the lesion closely observed. For instance, in an asymptomatic 30-35 year old, non-smoking female with a small, smooth nodule and delayed hypersensitivity to tuberculin or coccidioidin, the risks of cancer are small and the hazards of delayed diagnosis and treatment may be outweighed by the risks of thoractomy. Careful radiographic observation would then be justified. However, since early diagnosis and surgical resection offers the greatest potential for cure, such an approach should be taken only with great caution.

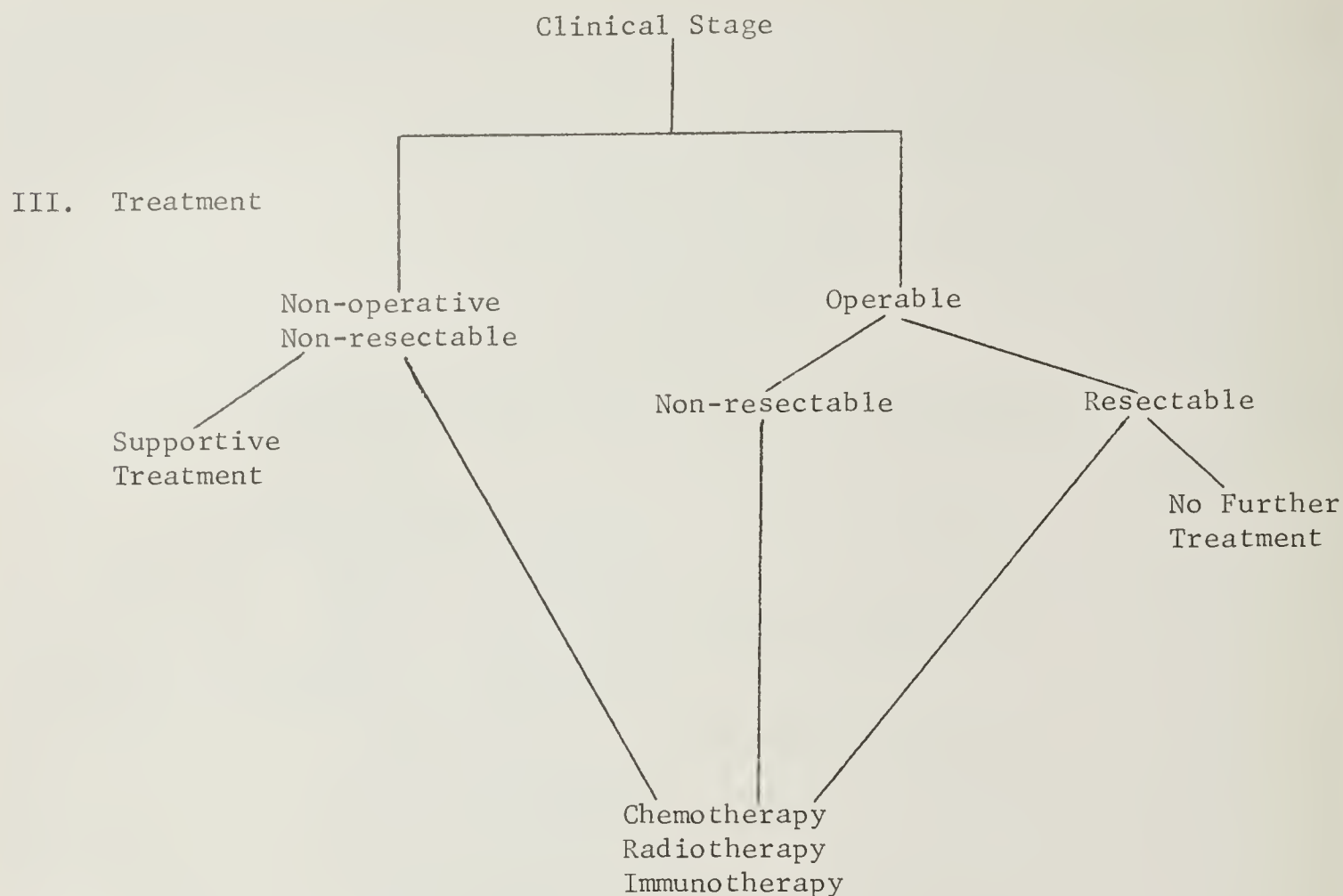
Histologic classification at the Tucson Veterans Administration Hospital utilizes the WHO Classification of Pulmonary Neoplasms as the basic nomenclature for diagnostic purposes. Histologic classification has a major impact on the natural course and prognosis of lung cancer and is a major factor in the selection of optimal therapy. In particular the classification of a tumor as a small cell carcinoma is considered an indication of nonresectability and further management should proceed as

outlined in Figure II. Patients with diagnoses of epidermoid carcinoma, adenocarcinoma, large cell undifferentiated carcinoma, or mixed types should undergo further procedures to determine operability and resectability.

PREOPERATIVE EVALUATION

The purpose of preoperative evaluation in the patient with bronchogenic carcinoma is two-fold: first, to assess the potential morbidity and mortality of thoractomy and the possible resection of functioning lung tissue, and second, to assess the possibility of complete surgical excision of the tumor and its metastases.

The assessment of operative risk requires a clinical judgement based on an analysis of multiple factors. Higgins and Beebe found in a retrospective analysis of 933 patients selected for operative treatment of lung cancer that age (greater than 60 years), heavy smoking history, presence of other significant pulmonary disease, the site and extent of pulmonary resection (i.e., right pneumonectomy) and the presence of intrathoracic extension of the disease were all associated with increased operative mortality.



In addition to these factors the presence of significant cardiovascular, hepatic or renal disease may also contribute to operative risk. For example, Tarhan and Associates, reported on a group of patients undergoing general anesthesia within 3 months following a myocardial infarction. Thirty-seven percent of the patients suffered a recurrent infarction within the first postoperative week with a mortality rate of 54%.

Preoperative evaluation of pulmonary function also plays a major role in the assessment of operability. While a large variety of physiologic parameters have been evaluated, no single test has demonstrated a clear superiority in predicting the rate of postoperative pulmonary complications. The test with the highest correlation in a number of series has been the maximum voluntary ventilation or MVV which measures the amount of air a patient is able to move by breathing as deeply and rapidly as possible for approximately 12 seconds. Gaensler, in one series reported that of 13 post-operative deaths 12 patients had MVV's of less than 50% of predicted. Mittman observed 45% cardio-respiratory mortality in a group of patients with MVV of less than 50% of predicted, but only 9% if the MVV was greater than 50%.

In instances where preliminary ventilatory function studies reveal borderline pulmonary reserve efforts to evaluate regional pulmonary function have been

made. Bronchspirometry and radioisotopic analysis of ventilation-perfusion relationships require sophisticated equipment and/or specific technical skills. More recently Olsen et al have analyzed a simpler technique. They studied 56 patients who were judged by pulmonary function data to have excessive operative risk. By quantitative macroaggregate perfusion lung scanning they were able to predict postoperative FEV_{L0} (preoperative FEV_{L0} x % perfusion to non-resected lung). If this prediction was greater than 0.8 L the

patient was offered resection. Operative mortality was 8% for lobectomy and 18% for pneumonectomy, figures that they considered justified in view of the otherwise poor prognosis.

If a patient is considered an acceptable candidate for operative treatment further evaluation of the extent of disease is indicated.

Information gathered during the diagnostic evaluation may provide evidence of non-resectability. Superior vena caval syndrome, hoarseness with a paralyzed voice

Small Cell Carcinoma

Staging

Bone, brain, liver scans
X-ray of positive bone scan sites
Bone biopsy

Chemotherapy

Radiotherapy

Known tumor sites
Prophylactic to brain

Immunotherapy

Figure II

ord, extra thoracic lymph node involvement, small cell histology, and extension of tumor across the carina or into the trachea are all considered contraindications to surgical therapy.

Pleural effusion is not specifically a sign of extended disease. However, many authors consider hemorrhagic pleural effusion a contraindication to surgery. Cytologic examination of the fluid and pleural biopsy will confirm metastatic pleural involvement in 60-75% of patients.

The value of mediastinoscopy in the management of lung cancer remains controversial. Mediastinoscopy is a relatively safe procedure, 1.5% morbidity and 0.09% mortality. The diagnostic yield in unselected patients is in the range of 30 to 40%. By careful selection of patients according to tumor location, tumor histology and radiographic findings the diagnostic yield of mediastinoscopy can be made still higher. The addition of left parasternal mediastinotomy for left upper lobe lesions will further decrease the incidence of false negative procedures.

While mediastinoscopy and mediastinotomy are safe and effective methods to assess mediastinal nodal involvement in lung cancer controversy centers around the significance of this finding. Fosburg et al consider abnormal findings at mediastinoscopy a contraindication to subsequent thoracotomy. But Kirsh and his group report five year survival in squamous cell carcinoma of 34% in patients with mediastinal metastases treated by resection followed by post-operative irradiation. With adenocarcinoma, however, only 12% of patients with mediastinal involvement survived five years. Clearly, resolution of this conflict awaits further data from carefully staged and uniformly treated patients.

Bronchogenic carcinoma metastasizes early to a wide variety of organs. This is clearly reflected in the disappointing long-term survival statistics in patients who were considered to have undergone "curative resections". Careful search for such distant metastases will help to avoid pointless surgical procedures.

The liver is the most common site of metastasis from bronchogenic cancer, being involved in 42% of necropsy cases. Despite this frequency, in the absence of clinical suspicion of liver involvement, either by abnormal physical examination or abnormal liver function tests, liver scan revealed liver metastasis in only 3 out of 64 patients. Conversely, in the presence of clinical evidence of liver involvement 13 of 19 liver scans were positive. Because of the lack of specificity of chemical tests and liver scans histologic confirmation by liver biopsy should be obtained. If percutaneous liver biopsy is negative, peritoneoscopy will frequently confirm the diagnosis of metastatic liver disease.

Central nervous system metastases are

Stage	Description
0	Occult carcinoma: malignant cells in sputum, no evidence of primary or metastases.
1	Tumor <3 cm in diameter with ipsilateral hilar nodes, or tumor >3 cm without nodes.
2	Tumor >3 cm with ipsilateral hilar nodes.
3	Tumor larger than Stage 2, or any tumor with mediastinal or distant metastases.

Table 1.

found in 20-40% of patients at autopsy. Not infrequently CNS symptoms are the first manifestation of lung cancer. Headaches, dizziness, unexplained vomiting, seizure disorders and personality changes are frequent signs of cerebral metastasis of bronchogenic carcinoma. As with liver scan the yield is low, 3 out of 80 patients, when employed as a routine screening tool. However, in the presence of suspicious neurological symptoms 12 of 26 brain scans were positive.

The skeletal system is the other major site of metastasis in lung cancer. In fact due to deficiencies in sampling techniques autopsy series have undoubtedly long underestimated the incidence of skeletal metastasis in a variety of tumors. Two recent large series of more than 1500 bone scans each revealed 64 and 42%, respectively, incidences of skeletal metastases and their dire import, and because of the frequent lack of clinical, chemical or radiographic findings in the presence of skeletal metastasis, we feel that a bone scan should be a routine part of every pre-operative evaluation for lung cancer. Certain patterns of abnormality on bone scan are considered so typical of metastatic disease that further confirmation is not felt to be necessary. In equivocal cases radiographic or tomographic examination of abnormal areas may resolve the issue. If uncertainty persists, bone biopsy should provide histologic confirmation.

TREATMENT

The choice of treatment modalities and an assessment of prognosis in lung cancer depend on a careful analysis of the information made available by the previous procedures.

Clinical staging in lung cancer is designed to classify patients into homogeneous groups on the basis of those measurements of extent of disease which are available from the diagnostic and pre-operative studies previously undertaken. Mountain, Carr and Anderson have adapted the widely used TNM classification for lung cancer. The letter T represents the primary tumor with subscripts used to designate

size or involvement by direct extension. The letter N represents regional lymph node involvement. The letter M is used to designate presence or absence and extent of distant metastasis. The various T, N, M categories are then grouped to create a staging classification for the disease as shown in Table I.

Such a system affords rational choice of treatment and is strongly correlated with outcome. In addition, it provides the means to compare the success of a variety of treatment modalities in relatively homogeneous groups of patients.

Surgical resection of lung cancer continues to offer the greatest hope of long-term survival. The success of operative management, however, continues to be frustrated by the fact that the majority of patients are judged to be inoperable during the initial evaluation and of those selected for operative therapy many are found to be unresectable at thoracotomy. Survival rates following resection in collected series vary from 29% to 56%.

Mountain provided the following perspective on operative treatment of lung cancer:

Of every 100 lung cancer patients who are diagnosed, approximately 50 will be selected for thoracotomy in the average institution. Fifteen of these will undergo surgery for diagnostic reasons only, whereas five will undergo a deliberate palliative resection. The remaining 30 patients will undergo resection with some hope of long-term survival. Seven or eight patients of the total group will win the battle and three will die in the attempt.

Radiotherapy alone in lung cancer does not significantly alter survival in most series. However, enhanced survival has frequently been seen with the use of post-operative irradiation to areas of regional metastasis. In addition, palliation of local effects of lung cancer such as pain, superior vena caval obstruction, obstructive atelectasis and cerebral metastasis provides a major role for the radiation oncologist in the management of bronchogenic carcinoma.

The role of chemotherapy in carcinoma of the lung is evolving. Many agents are active as "single" drugs for each histologic type. Non-small cell carcinoma chemotherapy needs improvement. Still 20-30% of squamous adenocarcinoma needing palliation will respond to a variety of regimens. Multi-drug regimens are very effective for small cell carcinoma (70% response rate). Remission duration and survival time are clearly prolonged. Drug treatment of small cell carcinoma should be coupled with prophylactic whole brain radiation since the inevitable brain metastases are protected from drugs by the blood-brain barrier.

Recent information suggests that immunotherapy in the form of intrapleural postoperative BCG and/or systemic immuno-enhancement with the antihelminthic agent levamisole improves survival in resected non-small cell carcinoma of the lung. BCG by scarification and C. Parvum by inoculation also appear to prolong remission duration in patients whose "tumor burden" has been markedly reduced by surgery, radiation or chemotherapy.

The optimal treatment of bronchogenic carcinoma requires an organized multi-

disciplinary approach. Combination programs of surgery, radiation therapy, chemotherapy and immunotherapy offer the best hope for advances against the ravages of lung cancer. Furthermore these regimens must be strictly standardized and applied to patients who have undergone thorough and accurate clinical staging procedures to assure the evolution of maximal therapeutic regimens in the future.

SUMMARY

The incidence of carcinoma of the lung continues to rise at an alarming rate. One out of four cancer deaths in males and one of seven in females is currently due to lung cancer. Despite massive efforts directed towards earlier diagnosis and improved methods of treatment fewer than 10% of patients can expect to be alive 5 years after diagnosis.

Despite these gloomy statistics the outlook is far from hopeless and there is much that physicians can do to benefit these unfortunate patients. We feel that an organized systematic approach to diagnosis, staging and treatment of patients with bronchogenic carcinoma will provide significant benefits. The approach outlined in this presentation should allow diagnosis

and staging to be accomplished accurately and with the least possible delay, discomfort and risk to the patient.

Based on the information thus obtained the best possible therapeutic regimen can be selected for the individual patient. Furthermore, analysis of treatment results in carefully staged and homogeneously grouped patients can provide data for future refinements and improvements in the management of this most difficult clinical problem.

Complete bibliography available upon request



Drug Therapy Problems

ROBERT E. PEARSON, M.S., R.Ph.

Most practitioners rely upon their own reading plus other external sources to assist them in their quest to remain abreast of the biomedical literature. This feature is intended to provide finite information, to answer some questions, and to stimulate awareness of the availability of an unbiased source of biomedical information. The format will include: questions and answers, with the questions being provided by the readers and/or users of our service; abstracts from the literature; brief descriptions of newly-marketed items; brief discussions of new innovations in therapy; and short exercises regarding specific drug products.

Address all communications to the author, Mr. Pearson, is Education Research Associate with David Wastchak & Associates, Inc., Pharmaceutical Consultants, 1818 Grand Avenue, Phoenix, Arizona 85007, (602) 253-9323.

Q. Do you have any data regarding the success or failure rates of analgesics? In particular rates for patients with neoplastic disease.

A. The recently published book edited by Miller and Greenblatt contains just such information for a wide range of analgesics. The following is a list of drugs with their failure rates in patients with a primary diagnosis of neoplastic disease and failure rates in patients with other primary diagnoses:

- a) aspirin—36%/13%
- b) oral codeine—27%/12%
- c) parenteral codeine—25%/13%
- d) oral meperidine—29%/11%
- e) parenteral meperidine—12%/5%
- f) morphine sulfate—9%/4%
- g) PercodanR—29%/14%
- h) oral pentazocine—36%/16%
- i) parenteral pentazocine—25%/10%
- j) propoxyphene—34%/14%
- k) Darvon CompoundR—30%/13%

In each case the failure rate was defined as the percentage of unsatisfactory exposures among all drug exposures for which an efficacy rating was recorded. Data are the results of physician's judgments within the Boston Collaborative Drug Surveillance Program.

(Miller, R. R., and Greenblatt, D. J., Eds. *Drug Effects in Hospitalized Patients*, New York: Wiley Biomedical, 1976, 133-164)

ABSTRACT OF INTEREST: Juhl, E., Christensen, E., and Tygstrup, N.: The Epidemiology of the Gastrointestinal Ran-

domized Clinical Trial, *N Eng J Med* 296: 20-22, 1977.

The authors report the results of a review of the literature regarding gastroenterology for the years 1964 to 1974. The authors used medlars as the main source for generating citations to be analyzed for acceptability as randomized clinical trials. The search reviewed 1,976,561 citations with 35,228 meeting the first two criteria of relating to gastroenterology and to therapy. Further screening brought the total of randomized clinical trials down to 306 or 0.9% of all citations on gastroenterology for the ten-year study period. Distribution of the studies by organ shows the following: a) esophagus, 4; b) stomach and duodenum, 103; c) bile ducts, 5; d) liver, 25; 3) pancreas, 12; f) small intestine, 17; g) appendix, 3; h) hernia, 3; i) colon and rectum, 94; and j) multiple organs, 40. It is stated that if randomized clinical trials continue to increase from this reported level exponentially all trials will be so by 2010, or if the increase is linear it will take about 700 years to reach the 100% level.

ABSTRACT OF INTEREST: Wright, J. M., McLeod, P. J., and McCullough, W.: Antihypertensive Efficacy of a Single Bedtime Dose of Methyldopa, *Clin Pharmacol Ther* 20: 733-737, 1976.

Seventeen hypertensive patients entered a double-blind crossover-study comparing the efficacy of the antihypertensive effect of methyldopa when the same total dosage was given three times daily or in a single dose at bedtime. Three patients dropped out

of the study. One because of non-compliance; another because of an elevated SGOT at initial blood determination; and the third because of side effects. The trial patients were randomly allocated to two schedules (i.e., TID dosing for 12 weeks followed by BID dosing and vice-versa) and were allocated to three dosing levels: 375mg, 750mg, or 1500mg daily. The dosing level was chosen to most closely approximate the patient's previous therapy. Placebo tablets made identical to methyldopa were used to ensure that patients always received the same number of tablets per day. All of the patients were allowed to continue their previous diuretic therapy throughout the trial. Chlorthalidone (13 patients) and pironolactone (1 patient) were the diuretics. All patients had been receiving methyldopa for 3 months prior to the start of the study and were judged to be "stable." Patients were reviewed at 4 week intervals. Results indicate no clinically significant differences in hypertensive control between the two regimens. On bedtime dosing the supine and erect systolic pressures were slightly lower at 8 a.m. than on TID dosing ($P < 0.05$). Systolic and diastolic pressures were slightly higher at 8 p.m. than at 8 a.m. in the bedtime regimen ($P < 0.05$). The authors suggest that patients may be safely switched from divided dose methyldopa therapy to single total dose bedtime therapy with no loss of blood pressure control and no increase in side effects.

thromboemboli than in the other patients. ten patients died and in the 110 survivors all 10 cases of thromboembolism occurred in a group of 51 patients with a peak plasma fibrinogen value of 750 mg./dl. or more. While in the other 59 patients with a plasma fibrinogen level less than 750 mg./dl., no thromboembolic phenomena occurred. Plasma fibrinogen level was usually measured daily for the first 6 days and thereafter every 2-3 days, until discharge. Increased plasma fibrinogen correlates with increased plasma viscosity and after an acute M.I., also correlates with an increase in thromboplastin generation, an increased rate of platelets utilization and an increase in thrombin/thromboplastin activity. While high serum enzymes levels (presumably reflecting large infarcts), also indicate a high risk of possible thromboembolism, a high plasma fibrinogen seems to be a better indicator. As a result of this study the authors give every patient with acute M.I. 10,000u. Heparin S.C. twice a day for 6 days and a loading dose of Warfarin on the 4th day, unless there is a contraindication for anticoagulation. If plasma fibrinogen level starts to drop without reaching 750 mg./dl. the anticoagulants are stopped. If it reaches 750 mg./dl. (or more), anticoagulation with Warfarin is maintained for 6 weeks.

Cardiovascular disease mortality trends and oral contraceptive use in young women.

V. Beral (London School of Hygiene and Tropical Medicine) *Lancet* 2:1047-1052 (November 13) 1976.

Analysis of data on cardiovascular mortality in 21 countries indicate a definite increased risk among women of reproductive age (15-44 years old) using oral contraceptives. The data was obtained from World Health Organization reports. Women using oral contraceptives were compared with non users and showed a 5:1 increased relative risk for heart disease and hypertension, a 2:1 increased relative risk for cerebrovascular disease and a 3:1 increased relative risk for all cardiovascular diseases. Other factors, like changes in diagnostic fashion, changes in smoking habits and recent changes in lifestyle were reviewed and seemed unlikely to have contributed to the increased female cardiovascular mortality. The risks of cardiovascular disease and death also seem to apply to the newer "lower dose" contraceptive pills.

Preoperative prediction of postoperative deep vein thrombosis.

J. K. Clayton et al (University of Leeds, Leeds) *Br Med J* 2:910-911 (October 16) 1976.

A prognostic index for predicting which patients would develop postoperative deep vein thrombosis was devised using the

clinical and laboratory data, obtained before operation in 124 women about to undergo major gynecological surgery, both abdominal and vaginal. The following clinical data were obtained: age, weight, height, pre-hospital length of stay, smoking habits, presence of varicose veins, past history of thrombophlebitis, the nature of the operation and whether surgery was for benign or malignant disease. The following laboratory tests were used: preoperative hemoglobin, platelets count, platelet factor III release, fibrinogen level, antithrombin III, factor VIII, plasminogen, antiplasmin, euglobulin lysis time, serum fibrin related antigen, activated partial thromboplastin time, thrombin time and platelet aggregation. Preoperative isotopic scanning of the legs with ^{125}I -fibrinogen showed that no patient had evidence of deep vein thrombosis. After operation 20 of the 124 patients developed deep vein thrombosis of the legs, confirmed by isotopic scanning and/or ascending venography. The five variables with the best predictive power were: increased age, overweight, presence of varicose veins, increased euglobulin lysis time, increased serum fibrin related antigen. Ninety five percent of those who developed deep vein thrombosis of the legs were identified this way, while 28% of those who did not develop thrombosis also showed "false positive" results. It is known that low dose heparin or perioperative Dextran 70 can decrease the incidence of postoperative deep vein thrombosis; however, they may significantly increase the bleeding problems at the time of surgery. In view of this fact the use of the five clinical and laboratory predictive factors as criteria for selection of the possible high risk group seems a better alternative than the universal prophylaxis with low dose heparin or Dextran 70.

Hyperactive as young adults; preliminary report

L. Hechtmen et al (Montreal Children's Hospital, Montreal, Canada) *Can Med Assoc J* 2:625-630 (October) 1976.

Thirty five individuals, (34 men, 1 woman) 17 to 24 years old (mean age 19 years) diagnosed 10 years before as suffering from severe chronic hyperactivity were studied together with 25 watched controls (24 men, 1 woman; mean age 18 years 8 months). When the study was started 10 years ago, the hyperactive subjects were free of epilepsy, cerebral palsy and psychosis. They lived at home with at least one parent. They were matched with the control group for IQ, sex and socioeconomic class. At the conclusion of the study, they had not had any specific treatment for any length of time. The two groups did not differ significantly in mean height or weight or in electroencephalographic findings. Cognitive style test indicated that the hyperactive individuals continued to have more difficulty in



Abstracts

Prepared by
GEORGE LASTNICK, M.D.

Plasma fibrinogen and thromboemboli after myocardial infarction.

R. M. Fulton, K. Duckett (Stepping Hill Hospital, Stockport, Cheshire) *Lancet* 2:1161-1164 (November 27) 1976.

Out of 120 patients hospitalized with acute myocardial infarction, 10 patients experienced acute thromboembolic episodes (cerebrovascular accidents, pulmonary infarcts, peripheral emboli), occurring from 3 to 13 days after the onset of the acute M.I. Patients over 75 years of age, patients who suffered from diabetes, renal or hepatic failure, patients who underwent surgery within the past 2 months and patients who died within 24 hours after admission, were excluded from this study. Factors which might encourage formation of emboli and thrombosis (hypotension, arrhythmias, poor cardiac output, haemoconcentration) were not more common in patients with

reflection, but they were not more impulsive than the controls. As many hyperactive individuals as controls attended school, but the incidence of expulsion from high school was higher for the hyperactive group. There was no significant difference between the two groups in the number of individuals working full time, their relative job satisfaction and their employment status. More hyperactive individuals had committed thefts, while more controls had committed drug related offenses. There was no difference between the two groups for traffic violation, disturbing the peace, or offenses involving aggression. Neither group showed unusual prevalence of personality disorder or psychosis. The hyperactive subjects seemed to show more tension and they scored lower on "socialization" and "sense of well being". There was no significant difference between the two groups concerning psychiatric treatments (type, duration) for the last 5 years.



Topics Of Current Medical Interest

OF CURRENT INTEREST

JOHN W. KENNEDY, M.D.

More than half the medical malpractice cases that have been screened by the new Massachusetts Tribunal were judged to contain no physician blame, according to the states special commission report in the Boston Globe, December 8, 1976.

Fewer than one-quarter of the sixty-three unsuccessful claimants posted the \$2,000 bond necessary to allow them to proceed to trial, despite the tribunals unfavorable ruling. Because of this record it was urged by members of the Legislature that the State Insurance Commissioner freeze the current malpractice insurance rates. The insurance companies have applied for an increase of rate of forty to fifty percent which have been frozen at that level in 1975. The insurance commissioner will rule on this in a month or so.

In a county by county survey it was reported by the commission on malpractice that 277 medical malpractice cases were filed in the first eleven months of 1976. No figures were available in prior years. This is in keeping with the findings in most states that there is no central area where malpractice cases are filed and many times the insurance companies are extremely reluctant to supply them.

NEW PRODUCTS

For the handicapped—There has been announced a system which allows control of four to eight appliances from a single location.

For example a patient confined to bed or a wheelchair can turn off and on a light, a TV, a radio, a tape recorder, and other appliances, through the use of a single control switch. Solo Products, 2455 Front Street, West Sacramento, CA.



Book Review

Prepared by
RALPH L. GORRELL, M.D.

THE HEART DOES NOT SPEAK ENGLISH

The Heart Does Not Speak English. By William B. McGrath, M.D., Phoenix, Az.: O'Sullivan Woodside & Co. In cooperation with Camelback Hospital. 1975.

Three years ago, I would have agreed with teachers of English and lovers of the great language that the day of the essay and the essayist was past. A master essayist must be at once stimulation, entertaining, informative, thoughtful, perceptive. Who could be all these, and a physician, too?

When I read my first essay by Bill McGrath, I was hooked. I even subscribed to *Arizona Medicine* just to read them, to cut them out, to preserve them for re-reading. They were, and are, marvelous. Look at some of the headings: Hippie Post Mortem, Please Turn Down the Lights, Iatrogenics with a Grain of Salt, Papier-mache Physician, Unreality of Relationships, Wisdom, neurosis — The Effort to Save Face Patients who want you to Fail (this is worth the price of the book, alone, if it saves you from a few, insatiable patients who don't dare let their "crippling illness" improve, so blame everything on you), and so on. You just can't put the darn thing down.

These essays help you to face life, to understand yourself (if you really want to), to treat patients more intelligently (and god knows, we need lots of that). There are 50 separate entities. You will enjoy reading them, doctor or no doctor!

OLD PEOPLE: NEW BOOK:

"ADVOCACY AND AGE"

When Americans become interested in a "Cause", they (1) want a law passed, (2) want a group formed with this interest especially in mind, (3) want money from the government, any branch of government, (4) talk about it, (5) write about it—books, letters, newspapers, (6) start a fund raising campaign. Not necessarily in this order, because they must still form a committee and have a meeting, all complete with recorded speeches for later publication.

Occasionally, such a process can have good results, as witness "Advocacy and Age" a delightful, yellow-covered, paperback with academic overtones.*

It is published by the famous Andrus Gerontology Center at University of Southern California, under the editorship of Paul A. Kerschner. This center may be addressed at U.S.C. at University Park, Ca. 90007, if you want the book, have any questions or need any help.

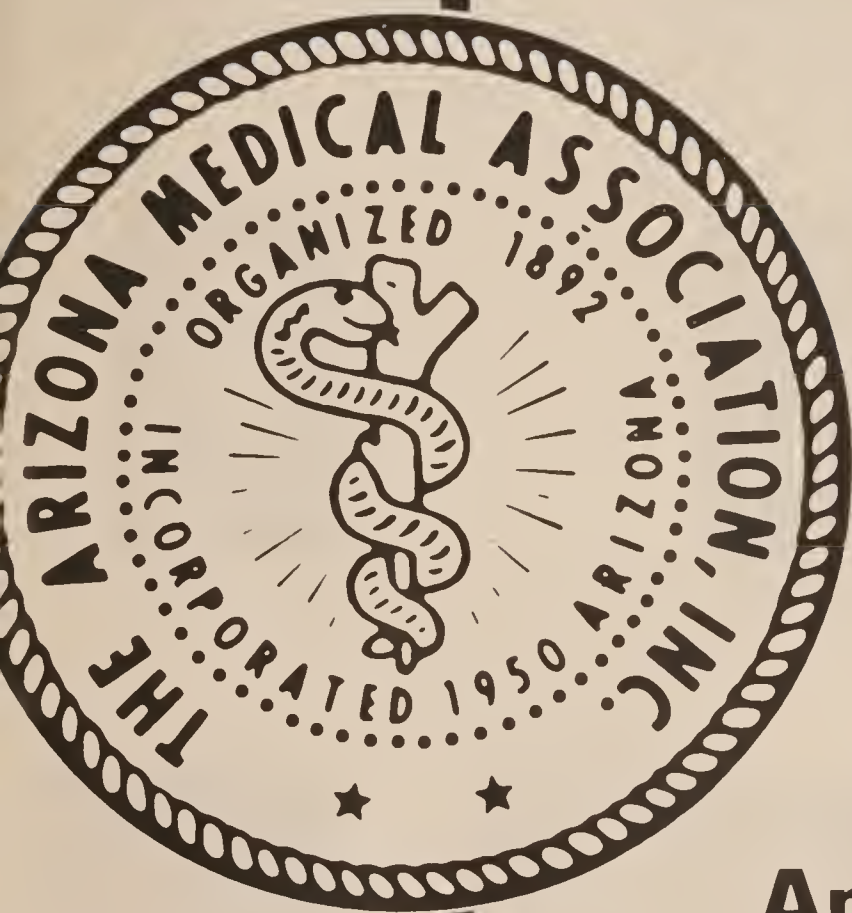
As any physician who goes to any medical meetings knows, he and his colleagues are rapidly heading for the aging process. For his own good and that of his patients, he should leaf through this small, compact volume.

The material is divided into three sections: Issues, Experiences, Strategies. These concern themselves with what the great points at issue really are, then with actual, personal experiences of those who have worked in the field and finally, the technics of what to do about the whole thing, i.e. legal services and organizations which will act as advocates for the elderly and be able to gain publication in various media of civilization.

For example., Paul Kerschner writing under the chapter heading, "Power, Pluralism and the Aged" (an attention getting title, no?) talks about propositions, i.e. older adults may identify with characteristics and values other than age, that is a 70 year old Indian woman may be an Indian first, a woman second and perhaps aged, last. If aging groups identify issues of major political and public policy implication, the issues and perhaps the groups will be co-opted by one or both of the major parties: Medicare or nutrition.

There are quoteable quotes throughout the text. You must see it to believe it.

*Advocacy and Age. Edited by Paul A. Kerschner. Los Angeles, Ca.: Ethel Percy Andrus Gerontology Center, University of Southern California, University Park, L.A. 90007. 1976.



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Schedule of Events

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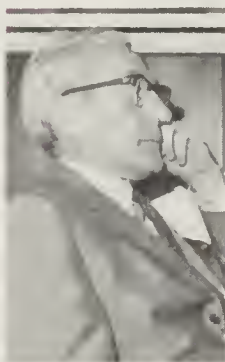
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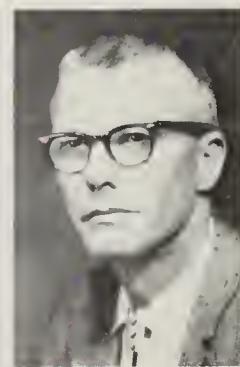
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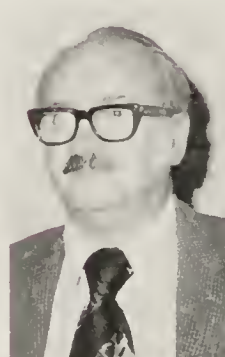
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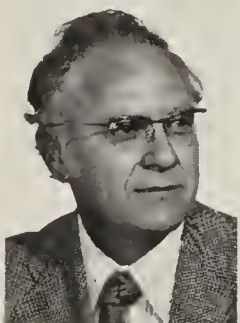
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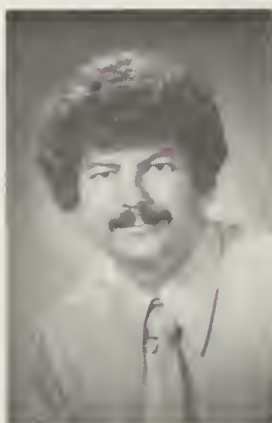
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PROGRAM

TUESDAY, APRIL 26, 1977

7:00 AM	Executive Committee Breakfast.....	Russell C
BOARD OF DIRECTORS		
9:00 AM	Board Meeting	Borein A & B
12 Noon	Board Luncheon	Hugos
HOUSE OF DELEGATES		
1:00 PM	First General Session	Remington & Russell

Call to Order
Robert A. Price, M.D., Speaker

Call to Order
Robert A. Price, M.D., Speaker

Invocation and Memorial Service
The Reverend Harry G. Secker
All Saints Episcopal Church

Welcome
Neil O. Ward, M.D., President
Maricopa County Medical Society

Introduction of Distinguished Guests
Ms. Sandy Bender, President, Arizona Chapter
American Association of Medical Assistants
Mrs. Norman H. Gardner, President
American Medical Association Auxiliary
Mrs. George L Hoffman, President
Arizona Medical Association Auxiliary
Richard E. Palmer, M.D., President
American Medical Association

Introduction of Incoming President
Edward Sattenspiel, M.D.

Presidential Address
John F. Kahle, M.D.

Regular Business of the House
Refer to the AGENDA section of the Delegates Manual

WEDNESDAY, APRIL 27, 1977

8:00 AM	Resolutions Reference Committe	Curtis B
	all members are welcome to participate	
8:00 AM	Amendments Reference Committee	Curtis A
	all members are welcome to participate	
12 Noon	Past-President's Luncheon	Remington A & B

SPORTS

12:30 PM Annual Tennis Tournament
Tempe Racquet & Swim Club
2140 E. Broadway Road, Tempe
Entry Fee: \$4.00 per person
—registration at the convention required

12:30 PM Annual Golf Tournament
Arizona Biltmore
24th Street & Missouri Avenue
Greens & Cart Fee \$21.00
—registration at the convention required

7:00 PM International Reception and Buffet Atrium Level
*Exciting foods from nine countries to please your palet: Swedish,
Chinese, Japanese, Italian, Mexican, American, Greek, Dutch and French.
Dress: Casual and relaxed. Good food, beverages and the beautiful music
of Tommy Reeds Orchestra*

THURSDAY, APRIL 28, 1977

7:00 AM Breakfast Remington & Russell
 7:30 AM Breakfast Program for Members and Spouses
 to Title: Continuing Medical Education
 8:45 AM Speaker: John N. Lein, M.D.
 Moderator: Robert E. T. Stark, M.D.

PHOENIX A ATRIUM LEVEL (169)	PHOENIX B ATRIUM LEVEL (169)	BOREIN A & B ATRIUM LEVEL (104)	ROOM 326 THIRD FLOOR TERRACE
IMMUNOLOGIC ASPECT OF CANCER Alex Fefer, M.D. Moderator: Boyden L. Crouch, M.D.	SECONDARY AMENORRHEA — EVALUATION AND MANAGEMENT Leon Spadoni, M.D. Moderator: William E. Crisp, M.D.	HEPATIC VENO-OCCLUSIVE DISEASE DUE TO SENEIO POISONING IN ARIZONA Alfred E. Stillman, M.D., Presentor Ryan Huxtable, Ph.D., Co-Author Paul Consroe, Ph.D., Co-Author Paul Kohnen, M.D., Co-Author Sandra Smith, M.D., Co-Author Moderator: Efren N. Hufana, M.D.	INFECTIOUS DISEASE A six-hour post-graduate course. Advance registration required GEORGE RAY, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF PATHOLOGY Starts at 8:00 a.m. Concludes at 5:00 p.m.
MALIGNANT MELANOMA OF THE HEAD AND NECK Paul T. Lenio, M.D. Moderator: Boyden L. Crouch, M.D.	SELECTED SEXUALLY TRANSMITTED DISEASES: AN OVERVIEW AND UPDATE Paul J. Wiesner, M.D., Presentor Ronald K. St. John, Co-Author Moderator: William E. Crisp, M.D.	WHAT IS NEW IN CARDIAC PACING Ravi Koopot, M.D., Presentor Co-Authors: Edward B. Diethrich, M.D. Sam A. Kinard, M.D. Robert M. Payne, M.D. Moderator: Efren N. Hufana, M.D.	
CURRENT CONCEPTS IN THE TREATMENT OF SHOCK James Carrico, M.D. Moderator: Boyden L. Crouch, M.D.	HIGH RISK PREGNANCY Kent Ueland, M.D. Moderator: William E. Crisp, M.D.	RISK FACTORS IN CORONARY ARTERY SURGERY. REPORT OF 100 CONSECUTIVE AORTOCORONARY BYPASS OPERATIONS Lee B. Brown, M.D., Presentor A. Benchimol, M.D., Co-Author Moderator: Efren N. Hufana, M.D.	
RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	
SUICIDE David Raskin, M.D. Moderators: Thomas E. Bittker, M.D.	ESTROGEN — FEMININE FOREVER OR FEMME FATAL? James A. Austin, M.D., Presentor Joseph Boxer, M.D., Co-Author Moderator: Eugene Leibsohn, M.D.	METASTASIZING KERATOACANTHOMAS Paul L. Schnur, M.D., Presentor Co-Authors: Louis R. Akerman, M.D. Paul D. Bozzo, M.D. B. R. Burkhardt, M.D. Moderator: Merrill M. Abeshaus, M.D.	INFECTIOUS DISEASE A six-hour post-graduate course. Advance registration required. GEORGE RAY, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF PATHOLOGY Starts at 8:00 a.m. Concludes at 5:00 p.m.
ALCOHOLISM Murray Raskind, M.D. Moderator: Thomas E. Bittker, M.D.	USE OF ESTROGEN IN POST MENOPAUSAL WOMEN Leon Spadoni, M.D. Moderator: Eugene Leibsohn, M.D.	TOTAL ELBOW REPLACEMENT UTILIZING THE MODIFIED SCHLEIN ELBOW REPLACEMENT Joseph A. Dupont, M.D., Presentor Co-Author: Robert M. Lumsden, II, M.D. Moderator: Merrill M. Abeshaus, M.D.	

PROGRAM

12 Noon Specialty Society Luncheons

to

2:00 PM Arizona Chapter, American College of
Obstetricians and Gynecologists Remington A & B
Arizona Urological Society Remington C
Arizona Society of Physical Medicine and
Medical Rehabilitation Russell A
Arizona Academy of Family Physicians Russell B & C

2:00 PM Maternal Mortality Committee Meeting Room 327

	PHOENIX A ATRIUM LEVEL (169)	PHOENIX B ATRIUM LEVEL (169)	BOREIN A & B ATRIUM LEVEL (104)	ROOM 326 THIRD FLOOR TERRACE
P.M. 2-2:30	THE MYTH OF RESPONSIBILITY: A CASE FOR CONSCIOUSNESS James E. Campbell, M.D. Moderator: John T. Clymer, M.D.	THE USE OF BIOFEEDBACK AND GUIDED IMAGERY IN THE ARTHRITIC Elliot I. Wyloge, M.D., Presentor Ronald Sanders, D.P.M., Co-Author Moderator: Wayne Beck, M.D.	DECEPTIVE PAIN — CONFUSING CAUSES Michael H. Weiss, D.D.S. Moderator: James M. Hurley, M.D.	INFECTIOUS DISEASE A six-hour post-graduate course Advance registration required GEORGE RAY, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF PATHOLOGY
2:30-3	THE TREATMENT OF DRUG OVERDOSES Michael K. Compass, II, M.D. Moderator: John T. Clymer, M.D.	PREVENTION OF PREMATURE LABOR Kent Ueland, M.D. Moderator: Wayne Beck, M.D.	RHEUMATOLOGY REACTION PATTERN SCURVEY Harold Udelman, M.D., Presentor Donna Lou Udelman, Co-Author Moderator: James M. Hurley, M.D.	Starts at 8:00 a.m. Concludes at 5:00 p.m.
3-3:30	RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	
P.M. 3:30-4	DEMENTIA Murray Raskind, M.D. Moderator: Timothy R. Harrington, M.D.	INFERTILITY Leon Spadoni, M.D. Moderator: Thomas S. Henry, M.D.	UNDERSTANDING THE TEENAGER Discussants: George D. Comerci, M.D. Robert Cottor, M.D. Michael W. Choen, M.D. Moderator: Mrs. Julie Hoffmann	INFECTIOUS DISEASE A six-hour post-graduate course Advance registration required GEORGE RAY, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF PATHOLOGY
4-4:30	MEDICAL MANAGEMENT OF DEPRESSION David Raskin, M.D. Moderator: Timothy R. Harrington, M.D.	A HOME EXERCISE PROGRAM FOR RHEUMATOID DISEASE OF THE SHOULDERS Arnold J. Arem, M.D., Presentor John W. Madden, M.D., Co-Author Gloria Devore, Co-Author Moderator: Thomas S. Henry, M.D.		
4:30-5	INITIAL EVALUATION OF A TRAUMATIZED PATIENT James Carrico, M.D. Moderator: Timothy R. Harrington, M.D.	USE OF PROSTAGLANDIS IN INDUCTION OF LABOR Kent Ueland, M.D. Moderator: Thomas S. Henry, M.D.		

5:30 PM Maricopa County Medical Society Caucus Curtis B
 7:00 PM ArMPAC Reception Remington & Russell
 8:00 PM ArMPAC Annual Banquet..... Remington & Russell
 Guest Speaker: Representative Diane B. McCarthy
 Chairwoman — Health Committee
 Arizona House of Representatives

FRIDAY, APRIL 29, 1977

7:00 AM Breakfast Remington & Russell
 7:30 AM Breakfast Program for Members and Spouses
 7:30 AM to Title: The Final Illness of President George Washington
 8:45 AM Speaker: William C. Weese, M.D.
 Moderator: Edward Sattenspiel, M.D.

PHOENIX A ATRIUM LEVEL (169)	PHOENIX B ATRIUM LEVEL (169)	BOREIN A & B ATRIUM LEVEL (104)	ROOM 326 THIRD FLOOR TERRACE
ABNORMAL SEXUAL MATURATION IN CHILDREN Vincent C. Kelley, M.D. Moderator: Philip Levy, M.D.	THE COMATOSE PATIENT Michael K. Copass II, M.D. Moderator: Laurence M. Haas, M.D.	REGIONALIZED MEDICAL EDUCATION John N. Lein, M.D. Moderator: Wilbur C. Voss, M.D.	PAIN A six-hour post-graduate course. Advance registration required. JOHN D. LOESER, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF NEUROLOGICAL SURGERY Starts at 8:00 a.m. Concludes at 5:00 p.m.
CURRENT STATUS OF TERATOGENIC AGENTS IN HUMANS Ronald J. Lemire, M.D. Moderator: Philip Levy, M.D.	NEW DEVELOPMENTS IN THE MANAGEMENT OF BRONCHIAL ASTHMA Paul P. VanArsdel, Jr., M.D. Moderator: Laurence M. Haas, M.D.	ACROMEGALY: CLINICAL PRESENTATION, DIAGNOSIS AND TREATMENT Marshall B. Block, M.D., Presenter John P. Heileman, M.D., Co-Author Laurance B. Nilsen, M.D., Co-Author Moderator: Wilbur C. Voss, M.D.	
MANAGEMENT OF ADRENAL DISORDERS Vincent C. Kelley, M.D. Moderator: Philip Levy, M.D.	COMPUTED TOMOGRAPHY OF THE BODY: THE EXPERIENCE AT SCOTTSDALE MEMORIAL HOSPITAL Jonathan M. Levy, M.D., Presenter Co-Authors Paul W. Nykamp, M.D. M. Herbert Nathan, M.D. Moderator: Laurence M. Haas, M.D.	A RATIONAL APPROACH TO STRESS TESTING Howard J. Reuben, M.D., Presenter Co-Author Christine Mulligan, R.N. Moderator: Wilbur C. Voss, M.D.	
RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	
CLINICAL DIAGNOSIS OF MASSES APPEARING OVER THE SPINES IN CHILDREN Ronald J. Lemire, M.D. Moderator: W. Scott Chisholm, M.D.	THE IMMEDIATE CARE OF SICK AND INJURED Michael K. Copass II, M.D. Moderator: Suresh C. Anand, M.D.	URTICARIA ANGIO EDEMA Paul P. VanArsdel, Jr., M.D. Moderator: Neopito L. Robles, M.D.	

PROGRAM

	PHOENIX A ATRIUM LEVEL (169)	PHOENIX B ATRIUM LEVEL (169)	BOREIN A & B ATRIUM LEVEL (104)	ROOM 326 THIRD FLOOR TERRACE
11:30-12	MANAGEMENT OF GROWTH RETARDED CHILDREN Vincent C. Kelley, M.D. Moderator: W. Scott Chisholm, M.D.	CURRENT STATUS OF CHEMOTHERAPY OF CANCER Alex Fefer, M.D. Moderator: Suresh C. Anand, M.D.	STANDARDIZATION OF MAXIMAL TREADMILL EXERCISE TESTING IN CHILDREN R. L. Williams, M.D., Presentor L. L. Rhonemus, Co-Author D. L. Dever, Co-Author Moderator: Neopito L. Robles, M.D.	PAIN A six-hour post-graduate course Advance registration required JOHN D. LOESER, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF NEUROLOGICAL SURGERY Starts at 8:00 a.m. Concludes at 5:00 p.m.

12-2	12 Noon 2:00 PM	Specialty Society Luncheons Arizona State Allergy Society Remington A Arizona Chapter, American College of Surgeons Remington B & C Arizona Pediatric Society Russell A & B
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2-2:30	CLINICAL ASSESSMENT OF ABNORMAL HEADS IN INFANCY Ronald J. Lemire, M.D. Moderator: Marvin C. Schneider, M.D.	CORONARY ARTERY DISEASE IN INFANTS AND CHILDREN Lee B. Brown, M.D., Presentor Dudley Halpe, Co-Author Marian Molthan, Co-Author Jane Todd, Co-Author Moderator: Arthur V. Dudley, M.D.	SPORTS INJURIES —The Female Athlete —Early Recognition and manage- ment of the commonest musculo- skeletal problems in athletes —A System of Injury Recognition a model for use by the coach James Garrick, M.D.
2:30-3	MYCOBACTERIAL DISEASE IN CHILDREN IN ARIZONA: SPECTRUM, DIAGNOSIS AND MANAGEMENT William E. Larter, M.D., Presentor Otto F. Sieber, Jr., M.D., Co-Author Moderator: Marvin C. Schneider, M.D.	DRUG ALLERGY Paul P. Van Arsdell, Jr., M.D. Moderator: Arthur V. Dudley, M.D.	
3-3:30	RECESS — VISIT EXHIBITS	RECESS — VISIT EXHIBITS	
3:30-4	THE HYPERACTIVE CHILD GROWN UP Harris D. Murley, M.D., Presentor Co-Authors Warren F. Gorman, M.D., FACP Donald R. Milam, Ph.D. Moderator: Thomas C. Hartley, M.D.	THE USE OF ULTRASONOGRAPHY FOR EARLY DIAGNOSIS OF CHOLELITHIASIS AND THE DECISION TO OPERATE Ismar Cintora, M.D., Presentor Co-Authors Roy A. MacNeil, M.D. Avi Ben-Ora, M.D. Robert B. Gilsdorf, M.D. Moderator: Jerome Gerendasy, M.D.	
4-4:30	AGING Murray Raskind, M.D. Moderator: Thomas C. Hartley, M.D.	PERITONEOSCOPY IN THE EVALUATION OF LIVER DISEASE George E. Burdick, M.D. Moderator: Jerome Gerendasy, M.D.	

PHOENIX A ATRIUM LEVEL (169)	PHOENIX B ATRIUM LEVEL (169)	BOREIN A & B ATRIUM LEVEL (104)	ROOM 326 THIRD FLOOR TERRACE
TREATMENT OF INSOMNIA David Raskin, M.D. Moderator: Thomas C. Hartley, M.D.	SYSTEMS FOR MONITORING THE SEVERELY INJURED PATIENT James Carrico, M.D. Moderator: Jerome Gerendasy, M.D.	SPORTS INJURIES —The Female Athlete —Early Recognition and manage- ment of the commonest musculo skeletal problems in athletes —A System of Injury Recognition a model for use by the coach James Garrick, M.D. Moderator: William C. Brainard, M.D. Starts at 2:00 p.m. Concludes at 5:00 p.m.	PAIN A six-hour post-graduate course. Advance registration required. JOHN D. LOESER, M.D. ASSOCIATE PROFESSOR DEPARTMENT OF NEUROLOGICAL SURGERY Starts at 8:00 a.m. Concludes at 5:00 p.m.

7:00 PM

President's Reception

Regency Ballroom Foyer

8:00 PM

President's Banquet

Regency Ballroom

Guest Speaker: James S. Todd, M.D.

AMA Delegate, New Jersey

Special Feature: Antonio Mendoza, master of classical and Flamenco guitar

entertainment and dancing

SATURDAY, APRIL 30, 1977

6:00 AM

Pima County Medical Society Caucus Breakfast

Remington A

HOUSE OF DELEGATES

8:00 AM

Second General Session

Regency Ballroom

12 Noon

Board of Directors Meeting and Luncheon

Borein A & B

12 Noon

Specialty Society Luncheons

2:00 PM

Acupuncture Association of Physicians and Surgeons

Remington A

Arizona Neurosurgical Society

Remington B

Approved for 14 1/2 required hours toward the ArMA Certificate in Continuing Medical Education.

GUEST SPEAKERS

Visiting faculty from the College of Medicine, University of Washington

RONALD J. LEMIRE, M.D.
Associate Professor — Pediatrics
U of W

JONATHAN M. LEVY, M.D.
Scottsdale

JOHN D. LOESER, M.D.
Associate Professor,
Neurological Surgery, U of W

HARRIS D. MURLEY, M.D.
Phoenix

DAVID RASKIN, M.D.
Associate Professor of Psychiatry,
Dept. of Psychiatry, U of W

MURRAY A RASKIND, M.D.
Assistant Professor — Psychiatry
and Behavioral Sciences — U of W

C. GEORGE RAY, M.D.
Professor, Pathology and
Pediatrics — U of A

HOWARD J. REUBEN, M.D.
Phoenix

PAUL L. SCHNUR, M.D.
Phoenix

LEON R. SAPDONI, M.D.
Professor & Acting Chairman,
Obstetrics, and Gynecology, U of W

ALFRED E. STILLMAN, M.D.
Tucson

RONALD K. ST. JOHN
Phoenix

HAROLD UDELMAN, M.D.
Phoenix

KENT UELAND, M.D.
Professor of Obstetrics &
Gynecology, Director of OB/GYN
University Hospital, Seattle WA

PAUL P. VAN ARSDEL, M.D.
University of Washington

WILLIAM C. WEESE, M.D.
Phoenix

PAUL J. WEISNER, M.D.
Phoenix

MICHAEL H. WEISS, D.D.S.
Phoenix

R. L. WILLIAMS, M.D.
Phoenix

ELLIOT T. WYLOGE, M.D.
Tempe

JOSEPH A. DUPONT, M.D.
Phoenix

ALEXANDER FEFER, M.D.
Professor of Medicine — Medicine
Division of Oncology RK-25
U of W
American Cancer Society Professor
of Clinical Oncology

JAMES G. GARRICK, M.D.
Orthopedic Surgery,
Division of Sports Medicine
—U of W

VINCENT C. KELLEY, M.D.
Professor and Head, Division
of Endocrinology, Metabolism
and Renal Disease, Dept. of
Pediatrics — U of W

VINCENT C. KELLEY, M.D.
Professor and Head, Division of
Endocrinology, Metabolism and
Renal Disease, Dept of Pediatrics
U of W

RAVI KOOPUT, M.D.
Phoenix

WILLIAM E. LARTER, M.D.
Tucson

JOHN N. LEIN, M.D.
Associate Dean — Administrative
School of Medicine

PAUL T. LENIO, M.D., FACS
Sierra Vista

ARNOLD J. AREM, M.D.
Tucson

JAMES A. AUSTIN, M.D.
Phoenix

MARSHALL B. BLOCK, M.D.
Phoenix

LEE B. BROWN, M.D.
Phoenix

GEORGE E. BURDICK, M.D.
Phoenix

JAMES E. CAMPBELL, M.D.
Phoenix

JAMES CARRICO, M.D.
Professor of Surgery
Dept. of Surgery, U of W

ISMAR CINTORA
Phoenix

GEORGE COMERCI, M.D.
Tucson

MICHAEL K. COPASS II, M.D.
Assistant Professor of
Medicine (Neurology), Department
of Medicine (Neurology) U of W

ARMA AUXILIARY 47TH ANNUAL CONVENTION PROGRAM

MRS. JOSEPH RENO
President 1977-78

MRS. GEORGE L HOFFMANN
President 1976-77

MRS. RICHARD L. COLLINS
Convention Chairman 1976-77

TUESDAY, APRIL 26, 1977

9:00 a.m. — 4:00 p.m.	Registration	Lobby
11:00 a.m. — 4:00 p.m.	“Creative Moments”	Regency Ballroom
	Arts and Crafts	
1:00 p.m.	ArMA House of Delegates	Russell and Remington
	ArMA Auxiliary President’s Report	
	Mrs. George L Hoffmann	
	AMA Auxiliary President’s Address	
	Mrs. Norman H. Gardner	

WEDNESDAY, APRIL 27, 1977

9:00 a.m. — 4:00 p.m.	Registration	Lobby
9:00 a.m. — 4:00 p.m.	Hospitality Center	Atrium
9:00 a.m. — 4:00 p.m.	“Creative Moments (Arts & Crafts)	Regency Ballroom
9:00 a.m. — 4:00 p.m.	AMA-ERF Booth	Regency Ballroom
9:00 a.m. — 4:00 p.m.	Community Health	Regency Ballroom
9:30 a.m. —	Pre-convention Board Meeting	Borein A & B
	All state officers, chairmen and	
	County Presidents	
	Mrs. George L Hoffmann, President	
10:45 a.m.	Brunch	Russell A & B
	All auxiliary members	
11:30 a.m.	Mini-workshop	Borein A & B
	Conducted by Mrs. Joseph Reno	
	All Auxiliary members	
12:30 p.m.	Legislative Meeting	Arizona State Capitol
	Conducted by Mrs. John Clymer	
	All auxiliary members	
12:30 p.m.	Gavel Club Luncheon	
	Past presidents by invitation	
7:00 p.m.	International Reception	
	and Buffet	Atrium Level

THURSDAY, APRIL 28, 1977

9:00 a.m. — 4:00 p.m.	Registration	Lobby
9:00 a.m. — 4:00 p.m.	Hospitality Center	Atrium
9:00 a.m. — 4:00 p.m.	“Creative Moments” (Arts & Crafts)	Regency Ballroom
9:00 a.m. — 4:00 p.m.	AMA-ERF Booth	Regency Ballroom
9:00 a.m. — 4:00 p.m.	Community Health	Regency Ballroom

9:00 a.m. Breakfast Curtis A
 In-coming and Out-going State Officers
 and Chairmen and County Presidents
 Purpose: To turn over books and materials
 Conducted by Mrs. George L Hoffmann
 Committee Meetings
 Newsletter Editors
 Nominating Committee

10:00 a.m. First General Session Curtis A
 Election of Officers
 All auxiliary members urged to attend
 Conducted by Mrs. George L Hoffmann

3:30 p.m. Understanding the Teenager Borein
 Panel: George Comerici, M.D. A and B
 Michael W. Cohen, M.D.
 Robert Cottor, M.D.
 Moderator: Mrs. George L Hoffmann

7:00 p.m. ArMPAC Annual Reception Remington and
 Russell

8:00 p.m. ArMPAC Annual Dinner Remington and
 Russell
 Guest Speaker: Representative Diane B. McCarthy
 Chairwoman — Health Committee
 Arizona House of Representatives

FRIDAY, APRIL 29, 1977

9:00 a.m. — 11:00 a.m. Registration Lobby
 9:00 a.m. — 11:00 a.m. Hospitality Center Atrium
 9:00 a.m. — 11:00 a.m. "Creative Moments" (Arts & Crafts) Regency
 Ballroom

9:00 a.m. — 11:00 a.m. AMA-ERF Booth Regency
 Ballroom

9:00 a.m. — 11:00 a.m. Community Health Regency
 Ballroom

8:30 a.m. Continental Breakfast Curtis A
 9:00 a.m. Second General Session Curtis A
 Memorial Service
 AMA Auxiliary President's Report
 Mrs. Norman H. Gardner
 ArMA Auxiliary President's Report
 Mrs. George L Hoffmann
 All Auxiliary Members urged to attend

11:30 a.m. No Host Cocktails Adams Hotel
 Noon Luncheon
 ArMA President's Address, John F. Kahle, M.D.
 Greetings from AMA Auxiliary
 President, Mrs. Norman H. Gardner
 Installation of Officers
 Acceptance Speech by Mrs. Joseph Reno
 Fashion Show by Diamonds

6:30 p.m. ArMA Auxiliary President's Reception
 Mrs. Joseph Reno
 By invitation only

7:00 p.m. ArMA President's Reception Regency
 Ballroom Foyer

8:00 p.m. ArMA President's Banquet Regency Ballroom
 Guest Speaker: James S. Todd, M.D.
 AMA Delegate, New Jersey
 Special Feature: Antonio Mendoza,
 master classical and Flamenco guitar
 entertainment and dancing.



A GLASS OF BILLIARDS PLEASE

PAUL B. JARRETT, M.D.

Like the cowboy who walked into the saloon and ordered a glass of billiards, we can read but don't necessarily understand. There is reluctance to admit that we don't comprehend lest someone think we are ticks. Take this prize example of intellectual gobbledegook which should be nominated for the "obfuscation of the year" award:

"The Board of Registry, through the Commission on Medical Laboratory Personnel, has been conducting the above mentioned workshop throughout the United States for those interested in the credentialing of laboratory personnel."

"The objective of this workshop is to introduce and to teach the participants two specific techniques involved in criterion-referenced testing. At the conclusion of this workshop, participants should have a better understanding of the ASCP Board of Registry's approach to absolute standard testing. They should be able to evaluate their own efforts in examination construction and should be able to compare these with the Board's procedures. Major topics include: definition and explanation of criterion-referenced examinations based on absolute standards, including a comparison of these to norm referenced examinations based on relative standards; the anticipated evaluation system to be used by the Board for determining pass/fail criteria; an explanation of Bloom's taxonomy levels, definitions and stratifications, including sample questions and rationale; independence and interdependence of difficulty with taxonomy; question formats, construction techniques in relation to taxonomy."

Four of us (three of whom are considerably smarter than I) read and reread this scholarly jargon and we don't know what it says. If we did know what it said, we wouldn't need the workshop, but on the basis of this printed inducement to attend, we figured we'd feel about as much at home in the meeting as an Arab at Passover services.

This is the same type of snobbery that would produce a speech to the Ladies' Aid Society entitled, "Mixed Mesodermal Tumors of Mullerian Origin".

What we require is a writer whose style is somewhere between the Occupational Health and Safety Administration, who instructs us on how to boil water by

advising that first, we require a source of heat; and the I.R.S. who haven't written anything comprehensible yet.

"Credentialing" isn't in my dictionary. "Independence and interdependence of difficulty with taxonomy"? "Criterion-referenced examinations based on absolute standards"? "Bloom's Taxonomy levels"? One feels like the man who viewed the mishmash on his plate and said, "Do I or did I eat it?"

We should copy the rural church committee who fired the preacher. They allowed that he expostulated, and lauded and magnified real good, but he didn't tell them "wherein".

If the purpose of scientific papers and notices is to enlighten and communicate, this sophisticated garbage misses the mark. It does one thing however, it establishes the intellectual pecking order right off the bat.

Taking a page out of the book of the A.S.C.P., I have completed the first paragraph of my up-coming novel which you are now privileged to preview:

"The uxoriousness of this fulsome, flagitious, heinous man made her feel perforce that her meretricious role was inchoate. The thought of continuing in this obsequious state was invidious and lugubrious. Their marriage was a parody, a nugatory experience that was both mendacious and saturnine."

You can see by this sententious introduction that my perspicacity is peremptory.

I know that Bill McGrath will understand it; but now, who do you suppose is erudite and who is just plain ignorant?

EXCHANGING ONE PLAGUE FOR ANOTHER

JOHN W. KENNEDY, M.D.

Not too many years ago The Microbe Hunters was a popular rendition of the search for the cause and control of world wide diseases.

We have learned to control these diseases, cholera, rabies, diphtheria, typhoid, smallpox, bubonic plague, malaria and a myriad of others, at least we know what measures are necessary to control them, some of them still under incomplete ex-

termination. But for them we have substituted a myriad of chemical plagues.

Then came 'Silent Spring', and this indicated that the DDT control of insects brought with it a devastating effect upon the ecology.

One partial list of "life threatening substances" to join DDT as a substitute plague is:

1. PCB (Polychlorinated Biphenyl) from industrial waste discharged into water ways, linked to cancer and birth defects and detected in the milk of nursing mothers.

2. PBB (Polybrominated Biphenyl) a fire retardant which was accidentally mixed with animal feed, which found its way into the food chain in Michigan, also showing up in mother's milk.

3. Mirex, the carcinogen, persistent pesticide used against fire ants in the South which has leached into soil and water.

4. Kepone another pesticide contaminating Virginia's James River and the Chesapeake Bay, causing tremors and liver disorders, as well as decreased sperm production in men.

5. VC (Vinyl Chloride) which is used to manufacture polyvinyl chloride plastic, carrying as threat of angiocarcinoma of the liver.

6. Dioxin, the teratogenic, skin burning compound used to make a bactericide and herbicide, which spread a poisonous cloud over the Italian town of Seveso this summer and four months later sent a four year old girl to the hospital.

7. Mercury causing the devastating Minamata disease affecting the nervous system and named for Minamata Bay, Japan, into which mercury laden industrial waste was discharged, poisoning fish and those who ate them (Medical World News, Dec. 1976).

Very recently in mid October President Ford signed into a law the Toxic Substances Control Act which is thought to be the first step to aid in the control of the use of chemical agents in industry, before they are widespread in the environment, and before the toxic effects have been explored.

It may well be that unless the industrial nations of the world take some prompt and soul searching measures to control the spread of these new toxic chemicals, it may well be that those who are concerned about the Population Explosion are overly exercised about this. War, famine and disease previously controlled populations, now we may do it in a more subtle but devastating manner, toxic industrial chemicals.



Letters to Editor

Editor
Arizona Medicine

Gentlemen,
"The time has come," the walrus said,
'To speak of many things:
Of ships, and shoes, and sealing wax;
Of cabbages and kings;
And why the sea is boiling hot,
And whether pigs have wings.' "

—Lewis Carroll

The time will come, this spring, to speak of many things when the House of Delegates of ArMA meets.

Among the issues involved will be mandatory/unified membership in the AMA for ArMA members.

It is relatively simple to speak of ships without speaking of shoes, because the two subjects are not intimately related.

It is not so simple, however, to speak about mandatory/unified AMA membership without speaking about related issues, which include:

(a) Is the AMA a worthwhile organization?

(b) Does the medical profession in America need a strong representing organization?

(c) Is the AMA in favor of National Health Insurance?

I have no doubt that many members of the House of Delegates of ArMA will display their inability to exercise the intellectual dissection necessary to confine their remarks to the issue at hand without wandering onto related issues.

This letter is a challenge to members of our House of Delegates: If we want to talk about ships, let's disregard shoes for the time being.

Sincerely,
Howard Hyde, M.D.

Editor
Arizona Medicine

Dear Dr. Kennedy:

Allow me to commend your timely editorial appearing in the October issue of *Arizona Medicine* captioned "Professional Courtesy — A Dying Amenity."

To those of us still basking in the twilight of our chosen profession we find the present day devious approach to the practice of medicine both lamentable and alarming.

I refer not only to the dying amenities which you so vividly depict, but likewise to the slow death of our long accepted Hippocratic oath of medical practice.

You attribute the decadence of these amenities to the more recent generations in Medicine and I am prone to agree. Not only have these last few generations ushered in the exodus of professional courtesy but likewise ushered in the practice of medicine as a lucrative economic business.

I cannot accept your premise that "under our present economic circumstances this had to change and most of us feel it has changed for the better."

Economically — moneywise — devious — if this is the way we want it—yes. However, I still believe the large number of physicians practice and believe in the art of the practice of medicine and in medicine as an ethical humanitarian institution rather than a business.

This so called business of medicine has gotten sadly and rather wickedly in the minds of a great portion of the lay public.

Unfortunately the daily requirements of our social demands, escalated living and belly needs drain our purses today as never before.

Could it be the golden bait of federal funding so casually dangled before our eyes dispairsthe weaker ones among us from the pathway of truth and honesty inciting us to loiter in the hall of money changers.

Ours is a noble profession not a business. We do not live primarily for the purpose of making money. The most successful physicians and the happiest do not strive for excessive competence. Our profit and loss should not be measured in dividends. Our duty and joy are to discover the clinical truth and present it to suffering humanity from which we seek only that honorarium which is in keeping with the public we serve.

We as physicians face life not as a beggar, but proudly bearing gifts of clinical wisdom and succor.

The revered and great physicians of tomorrow like the great physicians of yesterday will not be the economist physician of today but the physician who gives of his time and himself to his patient.

But, alas, I hear a cry from the halls of medicine — "But this is a different era." "The approach to diagnosis and therapy has changed". "We see too many Patients." "Not time enough for detailed history and examination."

I agree, it is a different era — but likewise in the past the day of the physician knew no beginning and no end.

Our now mechanized factories of health belie the art of medicine — into a ten minute prescription conglomerate — usually a tranquilizer.

Yes, unfortunately in our present era, this is the way it is.

Medicine is also a glorious profession.

The humanitarian and noneconomic aspects of medicine bring out the very best in the dedicated physician. This is the coin of the physicians realm. To do less than

this will kill the thing he loves and rapid ensure the continued descent upon us of the practice of medicine by federal edict.

Thanking you, Dr. Kennedy for the privilege of reading your editorial which prompted me to amplify your prognosis with thoughts of my own.

Most Sincerely,
Arbos D. Munger, M.D.
Riviera, Arizona



ArMA Medical History

NOT SO ANCIENT HISTORY OXYGEN — TUCSON 1932

JOHN W. KENNEDY, M.D.

If you were a medical student or lowly house officer, in the early 30's you may have had the additional duty—check the oxygen tents.

Often as not the oxygen content, in the tent, fell far below the 40-50% desired to room ambient air level. So you sought out the harried nurse — bedside nursing was known and practiced by the RN's at the time, and together you remade the bed, adjusted rubber sheeting on the bed and tucked in the tent properly under the mattress.

Some thought this "Oxygen therapy" lowered the mortality from pneumococcal pneumonia, but true believers who had to type the sputum and give the specific rabbit anti serum, doubted such heresy.

The January 25, 1932 Issue of *Time*, just delivered, speaks well for the "new rapid Postal System" and describes an oxygen tent crisis in the Old Pueblo, 1932 style.

St. Mary's Hospital needed another oxygen tent for a child in extremis following a mastoid operation. A canvas of the ten other institutions in Tucson revealed all tents in use. But one was released by a patient recuperating.

Another chamber, (super tent) was ordered from New York, and departed by special plane from Curtis-Wright Air. This 'super tent' was a "Doctor Alvan Le Roy Barac Collapsible Oxygen Chamber." Bad weather and strong head winds forced the pilot to take three days to reach Tucson. The mastoid patient had died.

Those of you not around at the time, may be amused at the importance attached to oxygen therapy at the time. For as we see each room with its TV and oxygen wall jet, it is evident the oxygen habit is well established.

P.S. — Both the patient who died and the patient who released her tent were dependants of out of town newspaper bigwigs. I wonder what fate the non-newsworthy patients met — probably the same — with or without oxygen.

CASE OF THE CENTURY



This syndrome, thought to be no longer endemic, was noticed in a patient of Dr. Lawrence Salsbury. He encountered this bizarre case while serving as a medical missionary on the Island of Hainan off the South China Coast, (1915-1925). All the clinical objective signs of this syndrome were demonstrated on the photograph. (Sorry no credit for continuing education fans).

Dr. Salsbury supplied us with this photograph, clinical history and a liberal translation of the Chinese appellation of his condition "Sans Pinna" without ears. At that time it was still a custom to sever the ears from a wife who engaged in extramarital amorous adventures.

This patient was brought to Dr. Salsbury to have the ears repinned, but alas this was not possible.

AUXILIARY HIGHLIGHTS

JEAN (MRS. M. W.) PHILLIPS Auxiliary Editor

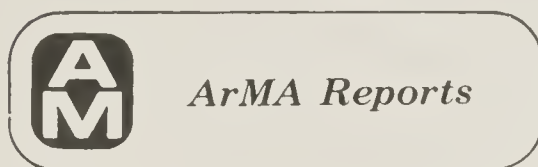
Members at large: a very special entity in any organization, but a particularly valuable source of support to the Arizona Medical Auxiliary! The same geographical distances in our state which require medical services to be delivered in far-away places, create outpost locations for wives of doctors in scattered communities which have localized needs crying to be met by those qualities so often found in the persons of medical wives.

Spouses of physicians located in counties other than the six now having organized Auxiliaries, may qualify as members-at-large who have access to the traditionally diversified material and encouragement of the Auxiliary program. Oriented to health

needs in the community, enrichment of the medical individual follows as a natural turn of samaritan activity.

Auxiliary membership is a demonstration of service through unified concern in countless dimensions ranging from health improvement to legislative aspects. Rewards of participation in the worthwhile effort enhance our own lives as we share the vehicle capable of reaching community health needs known to each in our own locale. Climb aboard and take your personal expertise, experience, compassion, and simple willingness to follow-up your awareness of problems with genuine response.

The Auxiliary welcome has been extended through Mrs. James (Carolyn) Parsons, 3161 N. Pantano Rd., Tucson 85715, current membership chairman. Your contact is eagerly awaited; so we can join forces in common effort and especially to get acquainted with you.



THE MINUTES APPEARING IN THIS SECTION HAVE BEEN EDITED TO CONSERVE SPACE. A COMPLETE COPY OF THE MINUTES OF ANY MEETING WILL BE MAILED TO ANY MEMBER REQUESTING THEM.

MEDICAL EDUCATION COMMITTEE

Meeting of the Medical Education Committee of the Arizona Medical Association, held Thursday, October 28, 1976, at 810 West Bethany Home Road, Phoenix, convened at 7:45 p.m., Robert E. T. Stark, M.D., Chairman, presiding.

PEER REVIEW AND MEDICAL AUDIT

In response to the charge given to the Medical Education Committee by the Executive Committee in September, 1975, Dr. Stark reported on the Patient Care Audit Program developed in California, and results of surveys of a random group of California hospitals and of all Arizona hospitals. Letter of August 11, 1976 to Dr. Brooks containing summary of all activities to that date was reviewed. Dr. Stark asked each Committee member present to report on his experience with medical audit in his present hospital affiliation(s). The general consensus seemed to be that, so far, medical audit is not very effective in discovering deficiencies in patient care nor as an educational tool.

As a response to the Executive Committee, the following motion was adopted;

IT WAS MOVED AND CARRIED THAT, IN VIEW OF THE FACT THAT THERE APPEARS TO BE A GREAT DEAL OF QUESTION AS TO THE PRESENT EFFECTIVENESS AND METHODOLOGY OF MEDICAL AUDIT, THE MEDICAL EDUCATION COMMITTEE FEELS THAT IT WOULD NOT BE APPROPRIATE AT THIS TIME TO EMBARK UPON A LARGE-SCALE PROGRAM OF EDUCATION IN MEDICAL AUDIT.

There was one dissenting vote recorded on the above motion. A second action was as follows:

IT WAS MOVED AND CARRIED THAT AN AD HOC COMMITTEE BE APPOINTED BY THE CHAIRMAN TO INSURE CONTINUED

STUDY OF THE MEDICAL AUDIT SITUATION AS IT HAS BEEN DISCUSSED AT THIS MEETING.

The following physicians accepted appointments to this ad hoc committee:

Robert E. Hastings, M.D., Chairman
Eric G. Ramsay, M.D.
Lawrence Z. Stern, M.D.
Charles A. Trahern, M.D.

CME REPORTING DATE

It was suggested that the reporting period be changed to the calendar year, thereby coinciding with the AAFP reporting period and eliminating some confusion.

IT WAS MOVED AND CARRIED TO RECOMMEND TO THE BOARD OF DIRECTORS THAT THE REPORTING PERIOD FOR CONTINUING MEDICAL EDUCATION ACTIVITIES BE EXTENDED TO THE 31ST OF DECEMBER, THIS CHANGE TO BECOME EFFECTIVE IN 1977 AND THAT THE DUE DATE FOR SUBMISSION OF APPLICATION FOR CONTINUING MEDICAL EDUCATION CERTIFICATE BE THE FIRST OF APRIL OF THE YEAR FOLLOWING THE END OF THE REPORTING PERIOD.

EXECUTIVE COMMITTEE OF THE HOUSESTAFF SECTION

Meeting of the Executive Committee of the Housestaff Section of the Arizona Medical Association, held Saturday, November 6, 1976, at the Arizona Center for Health Sciences, Tucson, convened at 11:00 a.m., Alan Engelberg, M.D., Vice Chairman, presiding.

THE IMPAIRED PHYSICIAN

Copy of letter dated November 1, 1976, from H. G. Butler, M.D., concerning methods of assisting physicians with psychological or other problems was reviewed for information.

IT WAS MOVED AND CARRIED TO REQUEST APPOINTMENT OF A HOUSESTAFF MEMBER TO THE PHYSICIAN REHABILITATION COMMITTEE OF ArMA.

The name of Neal Bauer, M.D., was recommended. A letter is to be sent to the President of ArMA requesting Dr. Bauer's appointment.

BUDGET

A recap of Committee expenses for the period

9/1/75 through 8/31/76 was reviewed. It was determined to recommend that budget amount of \$2,500.00 be recommended to the Board of Directors.

AMA CLINICAL MEETING

Housestaff representative to the December meeting in Philadelphia is Halley S. Faust, M.D., with Wayne Beck, M.D., to be the second representative if two are approved by ArMA. If Dr. Beck is funded by AMA, the second ArMA representative would be David Van Wyck, M.D.

RESOLUTIONS

Resolutions for introduction at the Resident Physicians Section Meeting in Philadelphia were discussed.

IT WAS MOVED AND CARRIED TO INTRODUCE RESOLUTIONS ON THE FOLLOWING SUBJECTS:

1. Supporting a one-year rotation to primary care post medical school,
2. Mandatory participation of local Housestaff in residency review committee inspections through the local housestaff association or some other mechanism.
3. Supporting the American Cancer Society in its anti-smoking campaign.

Resolutions are to be drawn up in proper form and submitted to ArMA for transmittal to AMA.

ANNUAL MEETING

Date of the annual meeting of the Housestaff Section will be Saturday, April 23, 1977, to be held at the ArMA headquarters just prior to the ArMA Annual Meeting. Daniel Asimus, M.D., President of PNHA, and Gaylord Nordine, M.D., Chairman of the Resident Physician Section, are to be invited to participate as key speakers. Further planning will take place at the next meeting of this group, probably in January.

SCIENTIFIC ASSEMBLY COMMITTEE

The meeting of the Scientific Assembly Committee of the Arizona Medical Association, Inc., held Saturday, December 11, 1976, at 810 W. Bethany Home Road, Phoenix, Arizona convened at 1:45 p.m. Luis S. Tan, M.D., Chairman presiding.

1979 MEETING

Mr. Robinson reported that the Safari Hotel and the Hyatt Regency Phoenix have given tentative commitments for the 1979 meeting. He pointed out that the Hyatt Regency Phoenix has adopted a new policy, effective after our 1977 meeting, of not using the ballroom for exhibits, which means that we would have to split the meeting between the civic center and the hotel, which would increase the costs of conducting the meeting.

1978 MEETING

The chairman announced that the California College of Medicine, University of California, Irvine has accepted our invitation to provide the primary faculty for our 1978 Annual Meeting.

LOCAL PAPERS

Following extensive review, IT WAS MOVED AND CARRIED TO SCHEDULE THE FOLLOWING PAPERS:

Marshall B. Block, M.D.

Acromegaly: Clinical Presentation, Diagnosis and Treatment

James E. Campbell, M.D.

The Myth of Responsibility: A Case for Consciousness

Alfred E. Stillman, M.D.

Hepatic Veno-Occlusive Disease due to Senecio Poisoning in Arizona

James A. Austin, M.D.

Estrogen — Feminine Forever or Femme Fatal?

Elliot I. Wyloge, M.D.

The Use of Biofeedback and Guided Imagery in the Arthritic

Jonathan M. Levy, M.D.

Computed Tomography of the Body: The Experience at Scottsdale Memorial Hospital

Paul L. Schnur, M.D.

Metastasizing Keratoacanthomas

Joseph A. Dupont, M.D.

Total Elbow Replacement Utilizing the Modified Schlein Elbow Replacement

Howard J. Reuben, M.D.

A Rational Approach to Stress Testing

R. L. Williams, M.D.

Standardization of Maximal Treadmill Exercise Testing in Children

Robert B. Gilsdorf, M.D.

The Use of Ultrasonography for Early Diagnosis of Cholelithiasis and the Decision to Operate

George E. Burdick, M.D.

Peritoneoscopy in the Evaluation of Liver Disease.

Warren F. Gorman, M.D.

The Hyperactive Child Grown Up

Arnold J. Arem, M.D.

A Home Exercise Program for Rheumatoid Disease of the Shoulders

Mr. Walter Q. Page

Selected Sexually Transmitted Diseases: An Overview and Update.

Edward B. Diethrich, M.D.

What is New in Cardiac Pacing

Paul T. Lenio, M.D.

Malignant Melanoma of the Head and Neck

William E. Larter, M.D.

Mycobacterial Disease in Children in Arizona: Spectrum, Diagnosis and Management

Lee B. Brown, M.D.

Risk Factors in Coronary Artery Surgery: Report of 100 Consecutive Aortocoronary Bypass Operations

Michael H. Weiss, D.D.S.

Deceptive Pain — Confusing Causes

Harold Udelman, M.D.

Rheumatology Reaction Pattern Survey

FRIDAY BREAKFAST

IT WAS MOVED AND CARRIED TO ASK WILLIAM C. WEESE, M.D. TO PRESENT HIS PAPER "THE FINAL ILLNESS OF PRESIDENT GEORGE WASHINGTON" AT THE FRIDAY MORNING BREAKFAST.

SCIENTIFIC EXHIBITS

IT WAS MOVED AND CARRIED TO APPROVE THE FOLLOWING SCIENTIFIC EXHIBITS:

Palmer C. Evans, M.D.

A Clinical Study of Lactation Suppression

Robert M. Lumsden, M.D.

Flexible (Silicone) Implant Arthroplasty

George Lastnick, M.D.

A One Year Myocardial Infarction Study at Walter O. Boswell Memorial Hospital

Fletcher E. Zimpfer, II, M.D.

Chemosurgery in the Treatment of Skin Cancer

Robert B. Gilsdorf, M.D.

Nursing Care of the Reservoir (Kock Pouch) Ileostomy Patient

David D. Dulaney, M.D.

Cataract Surgery Today — The Modern Rehabilitation of the Cataract Patient

Robert S. Waldman, M.D.

Whole Body Computed Tomographic (CAT) Scanning

R. L. Williams, M.D.

Diagnosis and Treatment of Symptomatic Arrhythmias with Transtelephonic Electrocardiogram

Ms. Shelley Clarfield

Education and Training in Rural Health

Steven I. Walsh, M.D.

Radiographic Exhibit of Causes of GI Bleeding

Edward B. Diethrich, M.D.

Clinical Application of Intra-Aortic Balloon Pump

Belton Meyer, M.D.

The Personality of the Newborn

PAST PRESIDENT'S LUNCHEON

Mr. Robinson explained that question had been raised as to whether we should continue the tradition of having a past president's luncheon.

IT WAS MOVED AND CARRIED TO CONTINUE THE PAST PRESIDENT'S LUNCHEON ON WEDNESDAY AS IN THE PAST.

EXECUTIVE COMMITTEE

The meeting of the Executive Committee of the Arizona Medical Association, Inc. held at the Phoenix Country Club, North 7th Street and Thomas Road, Phoenix, AZ on Friday, December 17, 1976, convened at 9:18 p.m., Edward Satterspiel, M.D., president and chairman, presiding.

MEDICAL AUDIT

The Medical Education Committee's letter of 12/15/76 in which it recommends that in view of the fact that there appears to be a great deal of question as to the present effectiveness and methodology of medical audit, that it would not be appropriate at this time to embark upon a large-scale program of education in medical audit was received for information.

It was noted that the Medical Education Committee was appointing a sub-committee to continue study of this matter.

NATIONAL HEALTH SERVICE SEMINARS IN LONDON

The AMA's letter of 12/2/76 inviting us to send representatives to London, England to participate in a seminar on National Health Insurance on May 23-27, 1977 was reviewed.

It was determined, that due to our attempts to reduce the budget, that we would not participate in this program.

DEPARTMENT OF HEALTH SERVICES

Dr. Dandoy reported that the department would not be providing a monthly page for *Arizona Medicine* in the future as they will have to utilize their present resources in other ways. She also reported on the current status of the swine flu immunization program and other activities of the department.

ARIZONA TASK FORCE ON MARRIAGE AND THE FAMILY

Judge Norman S. Fenton, in charge of the subject task force, responded to our offer to assist the task force and advised that he would be in touch with us when the work of the task force progresses.

UNIFIED MEMBERSHIP

The committee reviewed the eleven letters that were critical and the one letter that was complimentary of the House of Delegates action on 11/20/76 which continued the unified membership concept with the A.M.A. It was determined that the president would respond to each letter.

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INVESTMENT OF A FEW MIN

Hearing losses are among the most consistently neglected health problems. Many

people with them won't even admit it to themselves, let alone others. A little encouragement may start them thinking about themselves more realistically.


That's why we're offering you the poster shown here. You can hang it on the wall or stand it on a small table. It comes with booklets called "As

precious as sight" that give your patients some basic facts about auditory testing and hearing losses and how easy they are to correct in many cases.

Write to us for your free poster and booklets. They just might help you to help some patients who aren't hearing as well as they used to. Even those who ordinarily wouldn't hear of it.

Professional Relations Division, Beltone Electronics Corporation
4201 West Victoria Street, Chicago, Illinois 60646, an American company

Beltone
WHEN A HEARING
AID WILL HELP



WHEN
BURNING PAIN
COMPLICATES
ACUTE
CYSTITIS*

TURN IT OFF WITH
AZO GANTANOL[®]

Each tablet contains 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl.

FOR THE PAIN

- Quickly relieves painful symptoms such as burning and pain associated with urgency and frequency.
- Recommended antibacterial therapy: up to 3 days with Azo Gantanol, then 11 days with Gantanol (sulfamethoxazole).

Before prescribing, please consult complete product information, a summary of which follows:

Indications: In adults, urinary tract infections complicated by pain (primarily pyelonephritis, pyelitis and cystitis) due to susceptible organisms (usually *E. coli*, *Klebsiella-Aerobacter*, *Staphylococcus aureus*, *Proteus mirabilis*, and, less frequently, *Proteus vulgaris*) in the absence of obstructive uropathy or foreign bodies.

Note: Carefully coordinate *in vitro* sulfonamide sensitivity tests with bacteriologic and clinical response; add aminobenzoic acid to follow-up culture media. The increasing frequency of resistant organisms limits the usefulness of antibacterials including sulfonamides. Measure sulfonamide blood levels as variations may occur; 20 mg/100 ml should be maximum total level.

Contraindications: Children below age 12; sulfonamide hypersensitivity; pregnancy at term and during nursing period; because Azo Gantanol contains phenazopyridine hydrochloride it is contraindicated in glomerulonephritis, severe hepatitis, uremia, and pyelonephritis of pregnancy with G.I. disturbances.

Warnings: Safety during pregnancy not established. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been reported and early clinical signs (sore throat, fever, pallor, purpura or jaundice) may indicate serious blood disorders. Frequent CBC and urinalysis with microscopic examination are recommended during sulfonamide therapy.

Precautions: Use cautiously in patients with impaired renal or hepatic function, severe allergy, bronchial asthma; in glucose-6-phosphate dehydrogenase-deficient individuals in whom dose-related hemolysis may occur. Maintain adequate fluid intake to prevent crystalluria and stone formation.

Adverse Reactions: Blood dyscrasias (agranulocytosis, aplastic anemia, thrombocytopenia, leukopenia, hemolytic anemia, purpura,

FOR THE PATHOGENS

- Effectively controls susceptible pathogens such as *E. coli*, *Klebsiella-Aerobacter*, *Staph. aureus*, *Proteus mirabilis* and, less frequently, *Proteus vulgaris*.

*nonobstructed; due to susceptible organisms

hypoprothrombinemia and methemoglobinemia); allergic reactions (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); G.I. reactions (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); CNS reactions (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); miscellaneous reactions (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. *Usual adult dosage:* 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

NOTE: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

Supplied: Tablets, red, film-coated, each containing 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl—bottles of 100 and 500.

ROCHE

Roche Laboratories
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110

DYAZIDE[®]

Each capsule contains 50 mg. of Dyrenium[®] (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

Trademark

MAKES SENSE FOR LONG-TERM CONTROL OF HYPERTENSION*

**LOWERS
BLOOD
PRESSURE**

**CONSERVES
POTASSIUM**

Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* WARNING

This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with

cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K⁺ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K⁺ intake. The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy. Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K⁺ frequently; both can cause K⁺ retention and elevated serum K⁺. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium[®] (triamterene, SK&F Co.), and

leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

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TRIAMTERENE CONSERVES POTASSIUM WHILE HYDROCHLOROTHIAZIDE LOWERS BLOOD PRESSURE

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CODEINE COMBINATION PRODUCTS.
YOU MAKE THE CHOICE.**



**EMPIRIN[®]
COMPOUND
c̄ CODEINE
#3**

Each tablet contains:
codeine phosphate, 32 mg (gr ½),
(Warning: May be habit-forming);
aspirin, 227 mg; phenacetin, 162 mg;
and caffeine, 32 mg.



**EMPRACET[™]
c̄ CODEINE
#3**

Each tablet contains:
codeine phosphate, 30 mg (gr ½),
(Warning: May be habit-forming);
and acetaminophen 300 mg.



Wellcome

Burroughs Wellcome Co.
Research Triangle Park
North Carolina 27709

ADMINISTRATIVE ASSISTANCE TO THE ARMA AUXILIARY

Dr. Clymer's letter of 12/6/76 regarding providing assistance to the auxiliary was discussed at length.

IT WAS MOVED AND CARRIED TO REFER THIS MATTER TO THE FINANCE COMMITTEE.

MALPRACTICE ASSESSMENT

Status Report as of 12/16/76

John E. McCarville, M.D.
Lyle B. McDowell, M.D.
Leroy L. Merring, M.D.
John B. Miller, M.D.
Joseph M. Mitrick, M.D.
Vicente G. Mortel, M.D.
Kenneth J. Prebil, M.D.
Peter Sakkas, M.D.

PINAL

Robert S. Keller, M.D.
Glen L. Walker, M.D.

YAVAPAI

William T. Edmonds, M.D.
Melvin W. Phillips, M.D.
Mark J. Weservelt, M.D.

YUMA

Robert Anderton, M.D.
Abe I. Podolsky, M.D.

COUNTY	TOTAL BILLED	TOTAL PAID	OF TOTAL BILLED	OTHER ACCOUNT- RESPONSE	ED FOR	OF TOTAL BILLED
APACHE	10	10	100.00		10	100.0
COCHISE	30	24	80.0	5	29	96.7
COCONINO	54	48	88.9	3	51	94.4
GILA	11	9	81.8	1	10	90.9
GRAHAM	7	6	85.7	1	7	100.0
GREENLEE	9	9	100.0		9	100.0
MARICOPA	1317	1215	92.3	57	1272	96.6
MOHAVE	28	23	82.1	3	26	92.9
NAVAJO	6	6	100.0		6	100.0
PIMA	564	498	88.3	42	540	95.7
PINAL	33	25	75.8	6	31	93.9
SANTA CRUZ	6	5	83.3	1	6	100.0
YAVAPAI	42	33	78.6	6	39	92.9
YUMA	48	41	85.4	5	46	95.8
TOTAL	2165	1952	90.2	130	2082	96.2

Net Collected to Date: 195,270.00

Members who have not paid the assessment nor have been exempted as of December 16, 1976

COCHISE COUNTY

Edward H. Vogel, M.D.

COCONINO

Harvey L. Casebeer, M.D.
John C. Casebeer, M.D.
Henry W. Poore, M.D.

GILA

George E. Page, M.D.

MARICOPA

C. K. Adrian, M.D.
Akil T. Affan, M.D.
James S. Beck, M.D.
Robert C. Behrens, M.D.
Oscar J. Blende, M.D.
George L. Cannon, M.D.
William N. Chloupek, M.D.
James H. Coles, Jr., M.D.
Earl S. Cronk, M.D.
Robert L. Daywitt, M.D.
George C. Dimitropolis, M.D.
Richard E. H. Duisberg, M.D.
Charles L. Echols, Jr., M.D.
Hubbard F. Fellows, M.D.
John L. Ford, M.D.
George W. Gannon, M.D.
Arthur S. Goldberg, M.D.
Bradley I. Gordon, M.D.
Carlos V. Greth, M.D.
Charles W. Howard, M.D.
Hugh B. Hull, M.D.
Dale B. Hylton, M.D.
Richard L. Jones, M.D.
Charles V. Kachel, M.D.
Margaret L. Kerr, M.D.
Lester E. Kron, M.D.

William Selezinka, M.D.
George Serbin, M.D.
Ramon G. Shoen, M.D.
Antonina J. Sidorowicz, M.D.
Frank B. Simchak, M.D.
Austin L. Spitzer, M.D.
Dale H. Stannard, M.D.
Thomas N. Thomas, M.D.
Maier I. Tuchler, M.D.
Edwin W. Whiteford, M.D.
Adib Zaky, M.D.
Paul J. Zeltzer, M.D.

MOHAVE

George M. Clarke, M.D.
Raymond E. Hammer, M.D.

PIMA

William E. Berkley, M.D.
Iam M. Chessner, M.D.
Pacita R. Coss, M.D.
Robert L. Crowdes, M.D.
Luis S. Dalmendray, M.D.
Marc S. Feldman, M.D.
Morris H. Fine, M.D.
Barry A. Friedman, M.D.
Andrew W. Gaudielle, M.D.
Frank A. Gruver, M.D.
Charles E. Harter, M.D.
Charles J. Hornisher, M.D.
Helen Johnson, M.D.
Rashid A. Khan, M.D.
Paul W. Kohnen, M.D.
James Labelle, Jr., M.D.
Alberto R. Marquez, M.D.
George W. Nash, M.D.
Andrew W. Nichols, M.D.
Leland K. Reeck, M.D.
James G. Rothschild, M.D.
James E. Thomasson, M.D.
Willard R. Van Nostrand, M.D.
Robert W. Vaughn, M.D.

Requests for exemption for reasons other than financial hardship

1. Robert C. Behrens, M.D. — REQUEST DENIED
2. Richard E. H. Duisberg, M.D. — REQUEST DENIED
3. John L. Ford, M.D. — REQUEST GRANTED — Suggest Dr. Ford seek a change in membership classification as he is no longer in the active practice of medicine
4. Peter G. Sakkas, M.D. — REQUEST DENIED
5. Adib Zaky, M.D. — Request additional information regarding reason for the exemption

OTHER BUSINESS

Group Health Insurance Plan

Mr. Robinson reported that letters have been written (12/2/76) to the two Foundations for Medical Care to elicit interest in providing coverage to all physicians' offices in the state but responses have not been received to date. Additional work in other areas is progressing.

Joint Purchasing Program

Mr. Robinson reviewed the feasibility study being prepared by the Council of Western States Medical Association Executives to determine if there is need and/or demand for such a program as follows:

"FEASIBILITY OF JOINT PURCHASING PROGRAM"

Pursuant to the discussion held by the executive directors of seven state medical associations at the recent COWSMAE meeting (October, 1976), the staff of the Wyoming State Medical Society has researched the possibility of a joint purchasing program for the member physicians of two or more of the ten western state medical associations.

While it is apparent there would need to be further detailed investigation of any possible program, the following report includes information on the savings to be gained, possible organization of such a program, tested operational techniques now being used and some do's and don'ts gleaned from plans now operating.

USE OF JOINT PURCHASING PROGRAMS IN HEALTH CARE FIELD

From the limited investigation we have made, it would appear that joint purchasing programs are quite widespread in the health care field—although most plans have dealt with institutions rather than independent physicians. We found two programs currently dealing with joint purchasing for physicians—one in Western Pennsylvania and the second, in Harris County (Houston), Texas. The plan in Texas has gone far beyond joint purchasing for office equipment and supplies, and into consumer goods, which we can foresee could cause a multitude

of problems in a geographically large program.

In addition, it would also appear that a national association of medical clinics offers a group purchasing program to its members.

Several local or state hospital groups have utilized joint purchasing programs and national statistics for all fields show a minimum savings of fifteen (15%) per cent per institution or member for supplies and drugs and as much as fifty (50%) per cent for office and other types of equipment.

POSSIBLE OPERATIONS OF MULTI-STATE PHYSICIAN JOINT PURCHASING PROGRAM

The officials of the joint purchasing programs with whom we have spoken—in person and by telephone—made the following recommendations:

1. Don't become the supplier yourself.
2. Don't get into warehousing.
3. Don't become involved in cash discounts or rebates as a means of financially supporting a joint purchasing program.
4. Keep administrative costs to a bare minimum.

Keeping these cautions in mind, we would like to outline a possible organizational system based on what we have learned from operating joint purchasing programs.

ORGANIZATION

- A. Board of Directors. Possible composition—one physician and the executive director of each participating state medical association.

Responsibility: To supervise the activities and costs of joint purchasing program, the administrative staff, and perform liaison with the participating state medical associations.

- B. Purchasing Committee. Possible composition—one physician and one staff member from each participating state medical association and administrative staff member(s).

Responsibility: To review product task force committees' work, approve or disapprove committees' work and recommendations and to award contract to successful bidder.

- C. Product Task Forces. Composition—representatives of each state association with knowledge of the specific product under discussion and administrative staff member(s).

Responsibility: To determine market potential, specifications and potential suppliers for a specific product; to secure bids on product and make recommendation on bid acceptance to purchasing committee.

- D. Administrative Staff. Composition—a minimal number of persons employed by the joint purchasing program.

Responsibility: To negotiate contracts, prepare and distribute catalogs, conduct market potential surveys of members, conduct communications between state associations and suppliers on membership, handle complaints to suppliers and all other administrative details in connection with the JPP.

MEMBERSHIP

Membership would be available to all active members of a participating state medical association. The participating state association would offer membership in the JPP—on a voluntary basis—with its regular dues billing, collect the annual membership fee from the physician and forward the membership fee and the name of participating physician to JPP headquarters. Example: Annual membership fee—\$40. State association keeps \$5.00 for collecting membership and liaison work.

MODE OF OPERATION

Initially, the JPP would solicit from a selected sample of physicians in all specialties and general practice in all participating states the types, amounts and current prices of equipment, supplies and drugs which the physician or physician group uses. This survey would be conducted in the name of the participating state medical association.

From this data, the purchasing committee would be able to see the potential market and the most popular supplies, drugs and equipment. The committee would then request the Board of Directors to solicit from the membership a number of product task forces. These task force groups would establish specifications, verify the market potential and prepare a call for bids for a specific product.

If approved by the purchasing committee, the invitation to bid would be sent to suppliers suggested by the task force. The returned bids would be reviewed by the staff, product task force and accepted or rejected by purchasing committee. Administrative staff would then complete negotiations on contract.

In the beginning, several contracts would have to be negotiated in a short period of time. Then a catalog, containing information on these contracts, would be sent to physician members in the various states. After a period of operation, information on new contracts would be sent to members on a monthly basis.

Member physicians would order supplies, equipment or drugs directly from the suppliers, according to the terms listed in the catalog and payment would be made directly to that individual firm. The JPP office would supply the supplier with a list of members by state and non-JPP members' orders would not be accepted. The supplier would also render to the JPP office a monthly accounting of purchases made by JPP members so the program would know if it were meeting its estimated sales total.

As additional products are identified, more product task forces would be created and more contracts would be negotiated. The broader the spectrum of products offered to the members, the greater the benefits to the members in the JPP.

FINANCIAL ASPECTS OF A JOINT PURCHASING PROGRAM

Since the system presented limits administration to a minimum, costs should also be limited.

A \$40 membership fee for each member physician should suffice. If the individual physician only purchased \$1,000 of supplies (and this would be a rare case) and we were able to effect a 15 per cent savings, he would save \$110 a year (\$150 total saving minus his \$40 membership fee).

If we were able to enlist 4,000 physicians in the program, we would be able to raise \$160,000 a year to cover administration.

Initial costs would be higher since we would have to produce catalogs, prepare initial product line bids, pay expenses of committees, pay JPP personnel, and build a small reserve.

However, our projection would be that, once we reached a minimum number of participating physicians for operation (in the 3,000 to 4,000 range), we could operate at a \$25 per member cost per year.

We would propose that the membership fee be used in the following manner:

- \$5 to the state medical associations for collecting dues and membership names and performing liaison.

- \$25 for administrative costs.

The \$25 paid for administrative costs would be used in several ways:

1. Salaries for an administrative staff who handle negotiations with suppliers.
2. Expenses for task force committees who establish criteria for supplies and equipment.
3. Expenses for board members and committees.
4. Publishing and up-dating of catalogs.
5. General administrative expenses, i.e., rent, staff travel, furnishings.

- \$10 for establishment of a cash reserve and at year end, return excess funds to each state medical association on a pro-rata basis for the number of members they have in JPP.

Note: Upon completion of initial operation period, the membership fee might be re-calculated.

There would, of course, be a need for start-up funds. To meet this requirement, we would suggest that each participating state medical association loan the JPP \$5,000. This amount would be paid back out of reserves—hopefully within 14 months.

POTENTIAL DRAWBACKS OF A JOINT PURCHASING PROGRAM

In our discussion with operating JPPs some possible danger points which have been mentioned include:

- A. Members using the JPP agreement on specific products as a bargaining point with local suppliers.
- B. Purchasing task forces not doing their homework as to potential markets and the resultant failure of the JPP to reach its estimated dollar volume of sales.
- C. The desire of some individuals to purchase a particular brand or model of a product because of personal relationships, color or special decorations.

SUMMARY

From our initial examination, it would appear that a joint purchasing program for physicians through the western state medical associations would be feasible.

It is also apparent that additional investigations and much deliberation would have to be conducted before any start-up.

One thing is essential to the operation of such a program — WE WOULD HAVE TO BE ABLE TO DELIVER THE ESTIMATED SALES TOTAL. If we did not do this consistently, few suppliers would sign agreements with us.

It is somewhat difficult to ascertain a typical amount of purchases for a physician. It varies widely and depends on the specialty, the type of practice, rural or urban location, proximity to a hospital, etc. However, we have spotchecked with Wyoming physicians and can estimate that a physician should spend between \$2,000 and \$6,000 on drugs and supplies—not counting major medical equipment and office equipment purchases. This total, of course, also depends on the breadth of your definition of supplies.

It is also important to note that in states where the hospitals do not have purchasing groups, there seems to be some interest in joining a physicians' JPP. This addition would boost projected sales to totals substantially.

We have talked to the officers of the Wyoming State Medical Society and they would be interested in having the administrative offices for a possible JPP in Wyoming and are willing to allow their Society's executive director some time in working to create such a program.

If there is enough interest to proceed with the establishment of a physician JPP, we recommend that it only be handled through the state medical associations—and only those which endorse the program.

The ingredients for a physicians' joint purchasing program are at hand in the western states. Such a program would provide additional tangible benefits to members of a state medical association. Such a program could save physicians in private practice in our states millions of dollars. On an individual basis, there seems to be no major barrier to saving a minimum of 15 per cent in overall purchases of supplies, drugs and equipment."

IT WAS MOVED AND CARRIED TO AUTHORIZE UP TO \$300.00 TO TAKE THE NEXT STEP IN DETERMINING IF THERE IS A MARKET AND INTEREST AMONG THE MEMBERSHIP FOR SUCH A PROGRAM.

Patient Injury Prevention Proposal

Mr. Robinson reviewed the Patient Injury Prevention proposal being developed by the Colorado Medical Society and the Jeppesen Anderson firm of Denver, Colorado.

IT WAS MOVED AND CARRIED TO ASK THE MALPRACTICE INSURANCE CRISIS COMMITTEE TO ARRANGE TO HEAR THE COLORADO PRESENTATION. TO BE INVITED TO THE PRESENTATION WOULD BE MEMBERS OF THE MICA BOARD OF TRUSTEES AND SELECTED DEFENSE COUNSEL. THE COMMITTEE TO THEN PREPARE A RECOMMENDATION TO THE BOARD OF DIRECTORS OF ARMA.

Meeting adjourned 10:40 p.m.

LEGISLATIVE COMMITTEE

Meeting of the Legislative Committee of the Arizona Medical Association, held Saturday, January 8, 1977 at 810 West Bethany Home Road, Phoenix, Arizona, convened at 1:37 p.m., Selma E. Targovnik, M.D., Chairperson, presiding.

DEFINITION OF TERMS

Dr. Targovnik announced that the committee would continue to utilize the definition of terms developed a number of years ago by Mr. Jacobson, General Counsel for the Association. The terms to be utilized in consideration of legislation is as follows:

ACTIVE SUPPORT: Means approval of bill and maximum staff time and financial expenditure (including legal counsel) will be made to achieve enactment.

GENERAL SUPPORT: Means approval of the principle of the bill, but that staff time and financial expenditures will be limited.

NO ACTION: Means no position has been taken one way or another on the bill.

NON-SUPPORT: Means disapproval of the bill, but that staff time and financial expenditure will be limited to defeat the bill.

ACTIVE NON-SUPPORT: Means disapproval of bill and that maximum staff time and financial expenditure (including legal counsel) will be expended to achieve defeat of the bill.

PROPOSED LEGISLATION

HB 2002 — Medicaid; repeal

This bill if signed into law would repeal title 19 legislation currently on the books in the state of Arizona. The committee reviewed the substitute resolution adopted by the Arizona Medical Association House of Delegates, May 1, 1976 which actively encouraged our legislative bodies and State Health Department organizations to scrutinize all pending Medicaid legislation in a manner which recognized geographic needs and the adequate or inadequacies of existing local systems of medical care.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON HB 2002, THE REPEAL OF MEDICAID.

HB 2003 — Right to natural death for terminal patients.

This bill would prescribe procedures for execution of directive to withhold or withdraw life-sustaining procedures. It also provides for the exemption from liability and prescribed the conditions for effectuation of the directive as introduced by Representative William Lewis, by request. Mr. Lewis informed us that this bill is as adopted by the California Legislature with modifications to fit Arizona statutes. Legal counsel informed the committee that there were some problems with the bill as written and should be carefully considered.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO HB 2003 PROVIDING FOR A RIGHT TO NATURAL DEATH FOR TERMINAL PATIENTS.

Mandatory Maternity Coverage.

The Maternal and Child Health Care Committee petitioned the Legislative Committee to introduce into the 1977 Arizona Legislature, a maternity coverage bill similar to the American College of Obstetricians and Gynecologists model bill. The ACOG provided a great deal of information to the Association, including legislation enacted to date in New York, Maryland, California, Idaho, and Connecticut.

IT WAS MOVED AND CARRIED TO SUPPORT THE INTRODUCTION OF LEGISLATION PROVIDING FOR MANDATORY MATERNITY COVERAGE UNDER GROUP HEALTH INSURANCE PROGRAMS.

Amendments to the nurses practice act — nurse practitioners.

Mrs. Hazel Bennett, R.N., Executive Director of the Arizona State Nurses Association, presented proposed legislation which would remove language inserted in 1974 that the rules and regulations developed by the Board of Nursing as pertains to the Nurse practitioner would be authorized in collaboration with the joint Board of Medical Examiners and Osteopathy Examiners. It also would remove the ability for the nurse practitioner to dispense pre-packaged labeled drugs for single medical episode with certain proviso's. Mrs. Bennett informed the committee that it is the intent of the Board of Nursing to continue to investigate and approve programs intended to prepare nurse practitioners. Then the graduate of such approved programs would use their certificates from the Universities as evidence of preparation. This is the same process now being used by the R.N.'s who have master degrees in nursing and are employed as clinical specialists and those with matters in nursing service administration and are employed as directors of nursing.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON THE PROPOSED AMENDMENTS TO THE NURSES PRACTICE ACT PROVIDING FOR THE EXTENDED ROLE OF THE NURSE AT THIS TIME.

Physician's assistant.

Mr. Jacobson informed the committee that provisions currently in Arizona statutes providing for physician's assistant is in the opinion of the attorney general, unconstitutional. The current statutes do not provide proper guidelines to the Boards of Medical Examiners and Osteopathic Examiners. The new physician assistant proposal as drafted by legal counsel provides for purposes, objectives, and goals as well as duties of the joint Boards of Medical and Osteopathic Examiners. Considerable discussion ensued.

IT WAS MOVED AND CARRIED TO GENERALLY SUPPORT THE INTRODUCTION OF NEW LEGISLATION PROVIDING FOR THE PHYSICIAN'S ASSISTANT.

BOMEX — increase in reregistration fee

The Board of Medical Examiners by letter dated October 21, 1976 requested the Association to prepare an amendment to the Arizona Legislature which would increase the maximum annual reregistration fee from \$50.00 to \$100.00. Mr. Boykin informed the committee that he was unable to justify the increase in reregistration fee until the reregistration for 1977 had been completed (approximately February 1, 1977). It appears that a number of physicians from out of state currently licensed by the Arizona Board of Medical Examiners are not reregistering due to the increase to \$50.00 for 1977 and this was being considered for the 1977 budget. He stated that he should have a letter of justification in time for our next session.

IT WAS MOVED AND CARRIED TO MOVE THE BOARD OF MEDICAL EXAMINERS REQUEST FOR AN ADDITIONAL REREGISTRATION FEE TO THE NEXT MEETINGS AGENDA.

Confidentiality of associations committee proceedings and records.

Legal opinion by Mr. Shryl Neilson, firm of Snell & Wilmar, as requested by the Association, provides that "our conclusion that the records and proceedings of the Arizona Maternal Mortality Committee and the Grievance Committee, as well as other ArMA review committees probably are not confidential. Respectable legal arguments can be made on both sides of this question; however, following a careful review of the applicable law by myself and Bud Jacobson, we conclude that the arguments against confidentiality are likely to prevail in a court test. Therefore rather than rely on the possibility of judicial recognition of confidentiality . . . the better solution may be to seek legislative relief".

Dr. Chisholm informed the committee that the Arizona Council of Professions also had been concerned about confidentiality of Association records and committee proceedings as well as immunity and drafted legislation which would provide for immunity and confidentiality during the 1976 legislative session which was never introduced as the Arizona State Bar had indicated their opposition to such legislation if it provided for confidentiality of records and proceedings. The Council of Professions therefore has drafted proposed legislation for 1977 which would provide only for immunity for a person who makes decisions or recommendation as a member of a review committee and that he shall not be subject to liability for civil damages or legal action in consequence thereof.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT LEGISLATION TO BE INTRODUCED BY THE ARIZONA COUNCIL OF PROFESSIONS PROVIDING PROFESSIONAL IMMUNITY FOR PROFESSIONAL ASSOCIATIONS, COMMITTEE MEMBERS.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT THE INTRODUCTION OF LEGISLATION PROVIDING CONFIDENTIALITY OF RECORDS AND PROCEEDINGS OF PROFESSIONAL ASSOCIATIONS COMMITTEE ACTIVITIES.

Optometry — utilization of diagnostic drugs

Proposed legislation providing that diagnostic pharmaceutical agents authorized by the Board of Optometry may be used in the practice of Optometry was reviewed. Drs. Miles and Crowell, representatives of the Optomological Society, spoke in opposition to this proposed legislation.

IT WAS MOVED AND CARRIED TO ACTIVELY NON-SUPPORT LEGISLATION THAT DIAGNOSTIC PHARMACEUTICAL AGENTS AUTHORIZED BY THE BOARD OF OPTOMETRY MAY BE USED IN THE PRACTICE OF OPTOMETRY.

Outside professional services

Legislation is proposed for the department of health services to exempt physicians providing direct health care from competitive bidding provisions of law.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT THE DEPARTMENT OF HEALTH SERVICES PROPOSED LEGISLATION PROVIDING FOR AN EXEMPTION FOR PHYSICIANS PROVIDING DIRECT HEALTH CARE FROM THE COMPETITIVE BIDDING PROVISIONS CURRENTLY IN STATUTE.

Corrective amendments — department of health services

Dr. Dandoy explained a legislative proposal similar to legislation introduced during the past year which contains technical corrections to the

statutes concerning the Department of Health Services. Included in this measure, is an amendment which would allow the Department of Health Services to conform with the administrative procedures act regarding the notice for public hearings on rules and regulations. Currently the Department of Health Services must give a 60 day notice of public hearing as opposed to other agencies having to give only a 20 day notice for public hearing.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT THE CORRECTIVE AMENDMENTS REQUESTED BY THE DEPARTMENT OF HEALTH SERVICES WITH THE EXCEPTION THAT THE ILLIMINATION OF THE 60 DAY NOTICE FOR PUBLIC HEARING ON RULES AND REGULATIONS IS ACTIVELY OPPOSED.

Licensing of environmental water laboratories.

The Department of Health Services proposed legislation providing for the licensing and regulation of environmental water laboratories; prescribing procedures, powers and duties thereof. Dr. Dandoy explained the purposes of this legislation.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO LEGISLATION PROVIDING FOR THE LICENSING OF ENVIRONMENTAL WATER LABORATORIES.

Clinical laboratories; licensure exemptions

Dr. Dandoy explained that the department of health services is proposing amendments to the clinical laboratory licensing laws which would exempt some laboratory proceedings from the present licensing program where the activity does not pose a threat to adequate protection of the health of the public, and would allow persons such as paramedics and intermediate emergency medical technicians to take blood under the direction of a physician.

IT WAS MOVED AND CARRIED TO GENERALLY SUPPORT LICENSURE EXEMPTIONS IN CERTAIN CLASSES OF CLINICAL LABORATORIES AND ALLOWING PARAMEDICS AND INTERMEDIATE EMERGENCY MEDICAL TECHNICIANS TO TAKE BLOOD UNDER THE DIRECTION OF A PHYSICIAN.

Regulation of retail meat sales.

The Department of Health Services is proposing that the function of retail meat inspection be transferred from the live stock sanitary board to the Department of Health Services.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO THE TRANSFER OF THE FUNCTION OF RETAIL MEAT INSPECTION FROM THE LIVE STOCK SANITARY BOARD TO THE DEPARTMENT OF HEALTH SERVICES.

Safe drinking water act

The Department of Health Services proposed legislation which would grant additional authority to DHS in order to qualify for delcagation by the environmental protection agency to implement the federal safe drinking water act as a state program. It was explained should Arizona enact certain minimum standards, the federal EPA would delegate responsibility to the state.

IT WAS MOVED AND CARRIED TO GENERALLY SUPPORT THE PROPOSAL FOR A SAFE DRINKING WATER ACT BY THE DEPARTMENT OF HEALTH SERVICES.

Statewide health coordinating council (public law 93-641)

The Department of Health Services proposes that the legislature enact legislation which has as

its purpose to incorporate the concepts terminology of federal law PL 93-641 into statutes. Considerable discussion ensued concerning the American Medical Association as well the Arizona Medical Associations position on public law 93-641.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON THE DEPARTMENT OF HEALTH SERVICES PROPOSAL CONCERNING PUBLIC LAW 93-641.

Midwives

Dr. Dandoy, Director of Health Services explained that the department proposed introduce legislation providing that no midwife may be licensed after January 1, 1978. The legislation would not prohibit a registered midwife or other persons operating under personal direction and supervision of a qualified physician.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT THE REPEAL OF THE MIDWIVES ACT.

Mental health services amendments

Dr. Dandoy explained that amendments to mental health services act are being proposed result of a report submitted by a research group from the University of Arizona Law School under contract with the Department of Health Services. The recommended amendments address several issues of concern in the implementation of the including definition of dangers to self and others, confusion in the statutes as to guardianship procedures for emergency apprehension by enforcement agencies etc. Dr. James Campbell, Legislative Committee Chairman of the Arizona Psychiatric Society informed the Committee he had the opportunity to review the external amendments proposed and actively supports their adoption with minor modifications.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT LEGISLATION BEING INTRODUCED BY THE DEPARTMENT OF HEALTH SERVICES AND ENDORSED BY THE ARIZONA PSYCHIATRIC SOCIETY AMENDING PROVISIONS IN THE MENTAL HEALTH SERVICES ACT.



Future Medical Meetings

CONTINUING MEDICAL EDUCATION

FOLLOWING INSTITUTIONS AND ORGANIZATIONS
RECEIVED ACCREDITATION FOR CONTINUING
MEDICAL EDUCATION

ARIZONA STATE HOSPITAL PHOENIX
BERT SAMARITAN HOSPITAL MESA
GLENDALE SAMARITAN HOSPITAL PHOENIX
HEALTH MAINTENANCE ASSOCIATES
PHOENIX INDIAN MEDICAL CENTER
PIMA COUNTY GENERAL HOSPITAL PHOENIX
ST. MORIAL HOSPITAL PHOENIX
ST. LUKE'S HOSPITAL AND MEDICAL CENTER PHOENIX
ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER
PHOENIX
TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM
TUCSON
U OF A HEALTH SCIENCES CENTER
VETERANS ADMINISTRATION CENTER PRESCOTT
VETERANS ADMINISTRATION HOSPITAL PHOENIX

CONTINUING MEDICAL EDUCATION ACTIVITIES
SPONSORED BY THESE INSTITUTIONS RECEIVE CATEGORY
CREDIT FOR THE ARMA CERTIFICATE IN CONTINUING
MEDICAL EDUCATION AND THE AMA PHYSICIANS
COGNITION AWARD

APRIL

MEDICAL EDUCATION LECTURE

April 5, 1977, 7 a.m. Conference Room,
Glendale Samaritan Hospital. Sponsor:
Glendale Samaritan. Contact: Robert East-
man, M.D., 7800 N. 59th Ave., Glendale, Az
60301. Approved for 1 required hour
toward the ArMA Certificate in Continuing
Medical Education.

CLINICAL CYTOPATHOLOGY FOR PATHOLOGISTS — POSTGRADUATE COURSE

April 11-22, 1977, Johns Hopkins Univ.
School of Medicine. Johns Hopkins Univ.
School of Medicine. Sponsor: Johns Hop-
kins Univ. School of Medicine & Johns
Hopkins Hospital. Contact: John K. Frost,
M.D., 610 Pathology Bldg., The Johns
Hopkins Hospital, Baltimore, Maryland
21205. Before 2/28/77. Approved for 120
required hours toward the ArMA Certificate
in Continuing Medical Education.

86TH ANNUAL MEETING OF SOUTHWESTERN SURGICAL CONGRESS

April 25-28, 1977, Acapulco, Mexico.
Sponsor: Southwestern Surgical Congress.
Contact: Jack A. Barney, M.D., Secy-
reas. The Southwestern Surgical Con-
gress, 708 Physicians & Surgeons Bldg.,
Oklahoma City, OK 73103.

10TH ANNUAL CONFERENCE PERINATAL-PERINATAL MEDICINE

April 21-23, 1977, Scottsdale Hilton Hotel,
Scottsdale, AZ. Sponsor: Dist. VIII Ameri-
can College of Obstetricians & Gynecol-
ogists & Dist. VIII Nurses' Assoc. of
Amer. College of Obstetricians and Gynecol-
ogists. Contact: L. Joseph Butterfield,
M.D., Chairman, Perinatal Pediatrics Sec-
tion Dist. VII, American Academy of Ped-
iatrics, 1056 East Nineteenth Ave., Denver,
CO 80218.

86TH ANNUAL MEETING OF THE
ARIZONA MEDICAL ASSOCIATION
April 28-29, 1977. Hyatt Regency Hotel,
Phoenix, AZ. Sponsor: Scientific Assemb.
Committee of ArMA. Contact: Luis Tan,
M.D., Chairman, Scientific Assembly Com-
mittee, Arizona Medical Assoc., 810 W.
Bethany Home Rd., Phoenix, AZ 85013.
Approved for 14 1/2 required hours toward
the ArMA Certificate in Continuing Medical
Education.

MONTHLY OR WEEKLY

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Soc-
iety. Contact: Mrs. Mary Wood, 810 W.
Bethany Home Rd., Phoenix, AZ 85013.
Approved for 2 required hours per session
toward the ArMA Certificate in Continuing
Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tuc-
son Medical Center, Tucson, AZ. Sponsor:
U of A College of Medicine & Dept. of IM,
Dermatology Sect. Contact: Peter Lynch,
M.D., U of A College of Medicine, Tucson,
AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U of A
College of Medicine, Dept. of Internal
Medicine, Clinical Immunology Section.
Contact: John Boyer, M.D., U of A College
of Medicine, Tucson, AZ 85721. Approved
for 1 required hour per session toward the
ArMA Certificate in Continuing Medical
Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd &
5th Thursday — Rm. N318, VA Hospital,
2nd & 4th Thursday, Rm. 6505, Tucson
Medical Center. Sponsor: U of A College of
Medicine, Department of Internal Medi-
cine, Tucson, AZ 85721. Approved for 1
required hour per session toward the ArMA
Certificate in Continuing Medical
Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th
Tuesdays — Rm. 6505, AZ Medical Cen-
ter. 2nd & 4th Tuesdays — Rm. N318,
Veterans Adm. Hospital. Sponsor: U of A
College of Medicine, Dept. of Internal
Medicine. Contact: Sidney Salmon, M.D., U
of A College of Medicine, Tucson, AZ
85721. Approved for 1 required hour per
session toward the ArMA Certificate in
Continuing Medical Education.

GRAND WARD ROUNDS — TRAUMA
Every Tuesday, 8 a.m. Arizona Medical
Center, Tucson, AZ. Sponsor: U of A
College of Medicine, Surgery Dept. Trau-
ma Section. Contact: Martin Silverstein,
M.D., U of A College of Medicine Tucson,
AZ 85721. Approved for 1 required hour
per session toward the ArMA Certificate in
Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room
4410, Arizona Medical Center, Tucson, AZ.
Sponsor: Division of Ophthalmology, U of A
College of Medicine. Contact: H. E. Cross,
M.D., Ph.D., Arizona Medical Center, Dept.
of Surgery, Tucson, AZ. Approved for 2
required hours toward the ArMA Certificate
in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd, &
5th Wednesday — Staff Conf. Rm., VA
Hospital. 2nd & 4th Wednesday — Rm
5403, Arizona Medical Center. Sponsor: U
of A College of Medicine, Dept. of Internal
Medicine. Contact: Jay Smith, M.D., U of A
College of Medicine, Tucson, AZ 85721.
Approved for 1 required hour per session
toward the ArMA Certificate in Continuing
Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm.
8403, Arizona Medical Center, Tucson, AZ.
Sponsor: U of A College of Medicine Dept.
of Psychiatry. Contact: Alan Levenson,
M.D., U of A College of Medicine, Tucson,
AZ 85721. Approved for 1 1/2 required
hour per session toward the ArMA Certifi-
cate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona
Medical Center, Tucson, AZ. Sponsor: U of
A College of Medicine, Dept. of Surgery,
Trauma Section. Contact: Martin Silver-
stein, M.D., U of A College of Medicine,
Tucson, AZ 85721. Approved for 1 re-
quired hour per session toward the ArMA
Certificate in Continuing Medical
Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State
Hospital, Phoenix, AZ. Sponsor: Arizona
State Hospital. Contact: Howard E. Wulsin,
M.D., Arizona State Hospital, 2500 E. Van
Buren, Phoenix, AZ 85008. Approved for 1
required hour per session toward the ArMA
Certificate in Continuing Medical
Education.

SURGICAL GRAND ROUNDS
4TH TUESDAY OF EACH MONTH
Hospital Auditorium, Baptist Hospital, Phoenix. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 6036 N. 19th Ave., Phoenix, AZ 85015. Approved for 1 1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE
Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CAMELBACK HOSPITAL CLINICAL CONFERENCE
3rd Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

COUNTER TRANSFERENCE GROUP
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DESERT SAMARITAN HOSPITAL
Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Rosati, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS
Mondays — 12 Noon. D-5 North Conference Rm., Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE
3rd Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 926 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

BI-MONTHLY MEDICAL EDUCATION SEMINAR
Every other Wed. AM Begin 7/3/74. Maryvale Samaritan Hospital, Phoenix, AZ. Sponsor: Medical Staff Maryvale Hospital. Contact: Thomas J. Groves, M.D., 6037 W. Elm St., Phoenix, AZ 85033. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TUMOR BOARD CONFERENCE
Every Friday at Noon, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Phoenix Memorial Hospital. Contact: Howard Kimball, M.D., 333 West Thomas Road, Phoenix, AZ 85013. Approved for credit toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR
Third Monday of the Month, 6:30 p.m., Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 1201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS
Last Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U of A Medical Center, Dept. of Radiology. Contact: Irwin M. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE
1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MORBIDITY & MORTALITY CONFERENCE
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4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

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Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

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Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Sponsoring Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Century Medical Plaza, Suite 160, 1701 West St. Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.

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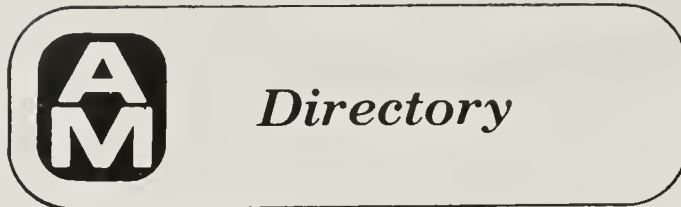
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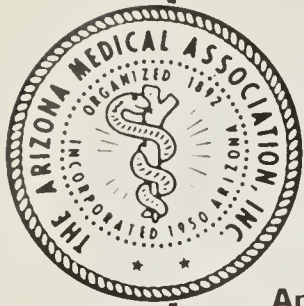
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**Hyatt
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April 26-30, 1977

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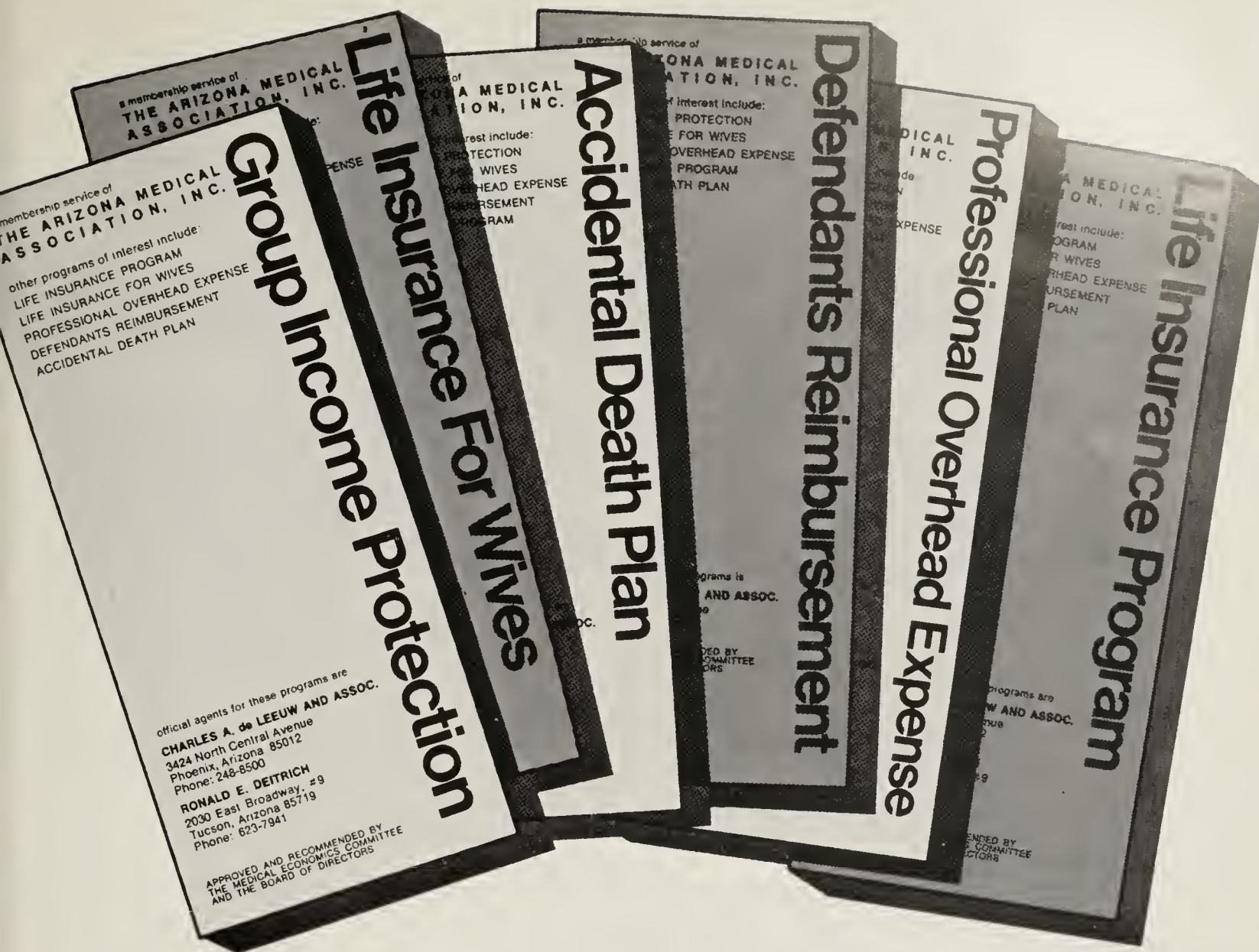
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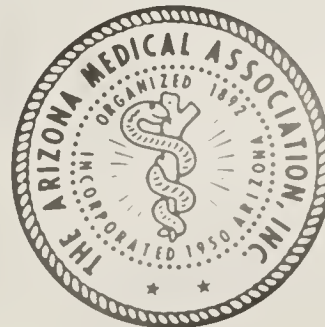
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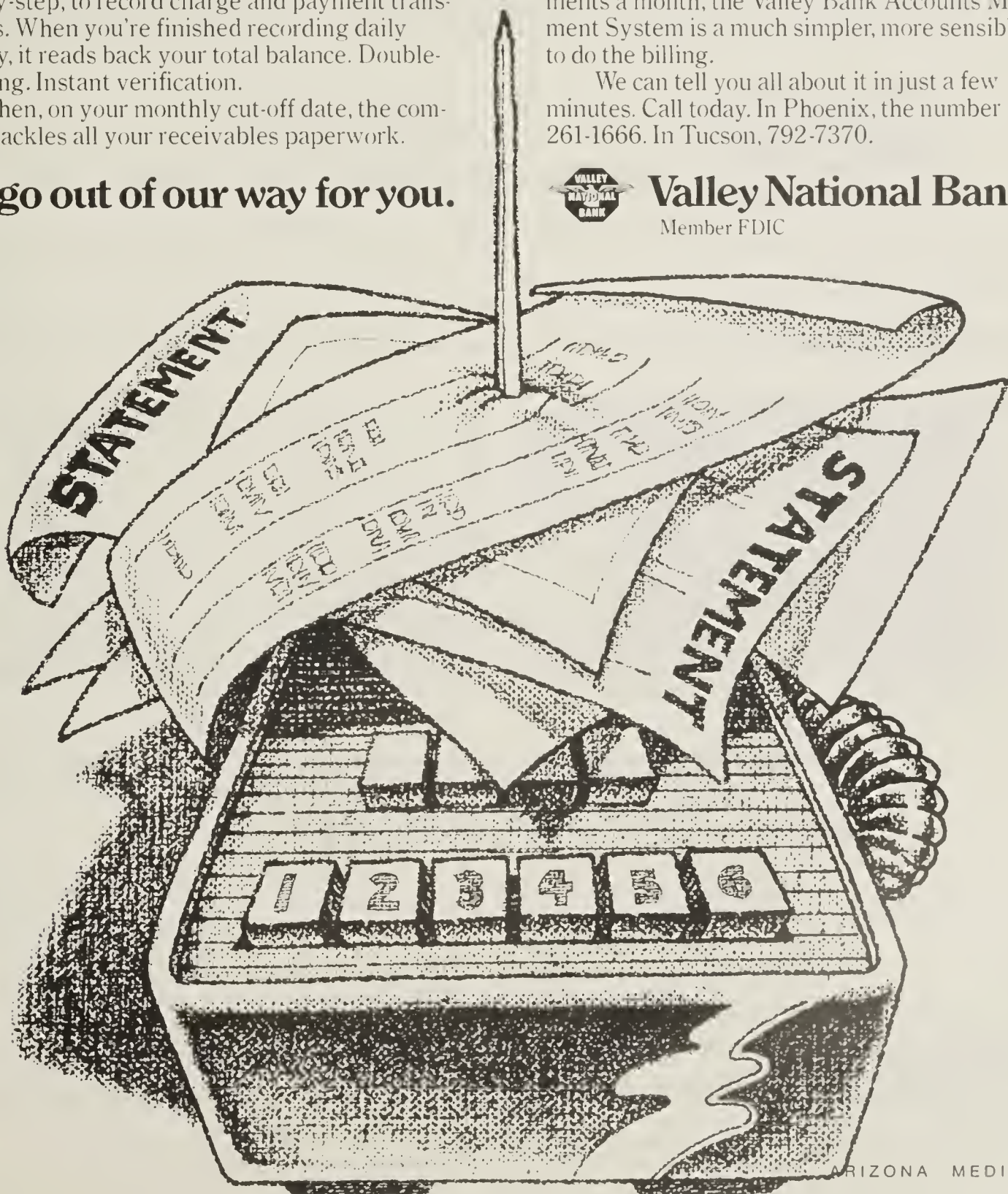
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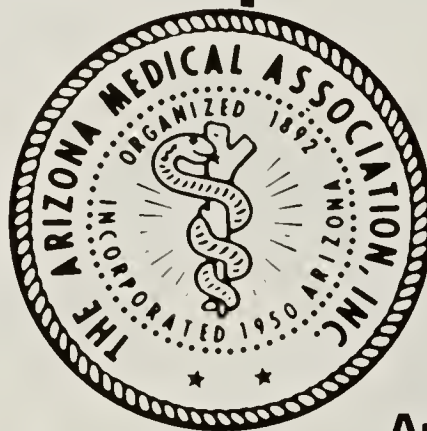
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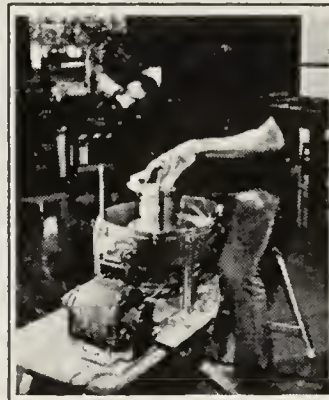
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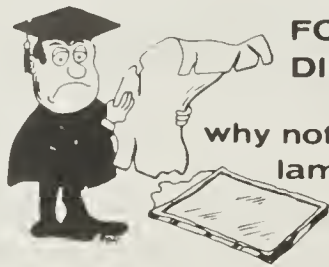


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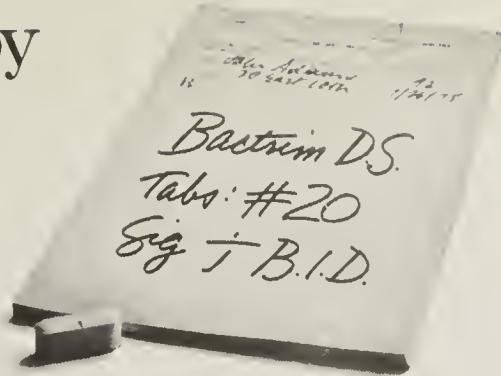
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10-day Bactrim therapy outperforms 10-day ampicillin therapy.



In a multicenter, double-blind study of patients with chronic or frequently recurrent urinary tract infection, Bactrim 10-day therapy outperformed ampicillin 10-day therapy by 27.2%, when comparing patients who maintained clear cultures for eight weeks. Criterion for "clear culture" was 1000 or fewer organisms/ml of urine.

While adverse reactions noted in this study were mild (e.g., vomiting, nausea, rash), more serious reactions can occur with these drugs. See manufacturer's product information for complete listing. Maintain adequate fluid intake; perform frequent CBC's and urinalyses with microscopic examination.

Note: Bactrim tablets were used in these clinical trials. Bioequivalency studies show one Bactrim DS double strength tablet is equivalent to two Bactrim tablets.

For chronic or frequently recurrent cystitis and pyelonephritis due to susceptible organisms.

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Chronic urinary tract infections evidenced by persistent bacteriuria (symptomatic or asymptomatic), frequently recurrent infections (relapse or reinfection), or infections associated with urinary tract complications, such as obstruction. Primarily for cystitis, pyelonephritis or pyelitis due to susceptible strains of *E. coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris* and *Proteus morganii*.

NOTE: The increasing frequency of resistant organisms limits the usefulness of antibacterials, especially in these urinary tract infections. The recommended quantitative disc susceptibility method (*Federal Register*, 37:20527-20529, 1972) may be used to estimate bacterial susceptibility to Bactrim. A laboratory report of "Susceptible to trimethoprim-sulfamethoxazole" indicates an infection likely to respond to Bactrim therapy. If infection is confined to the urine, "Intermediate susceptibility" also indicates a likely response. "Resistant" indicates that response is unlikely.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; pregnancy; nursing mothers.

Warnings: Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted. **Data are insufficient to recommend use in infants and children under 12.**

Precautions: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. *Blood dyscrasias:* Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. *Allergic reactions:* Erythema

multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. *Gastrointestinal reactions:* Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea and pancreatitis. *CNS reactions:* Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. *Miscellaneous reactions:* Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for children under 12. Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days.

For patients with renal impairment:

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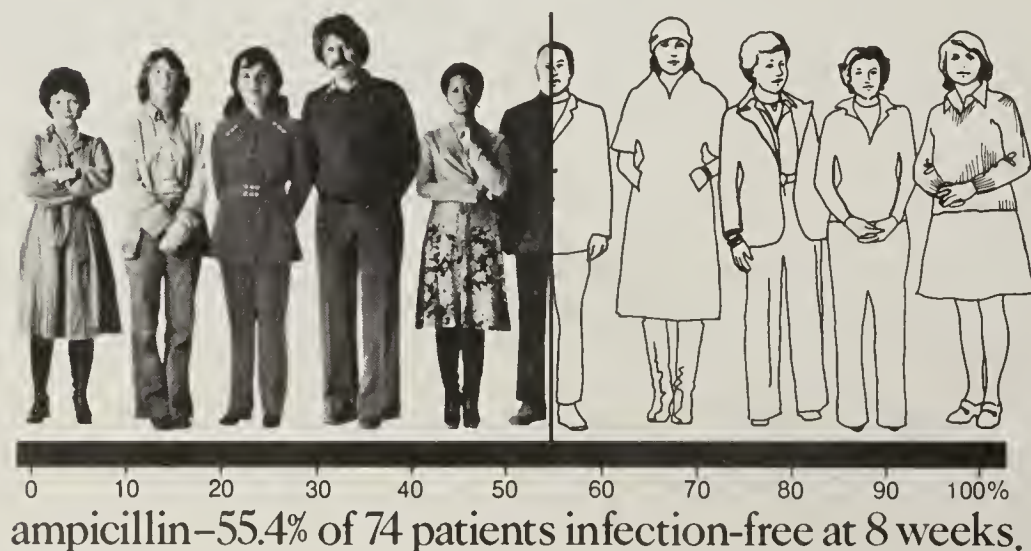
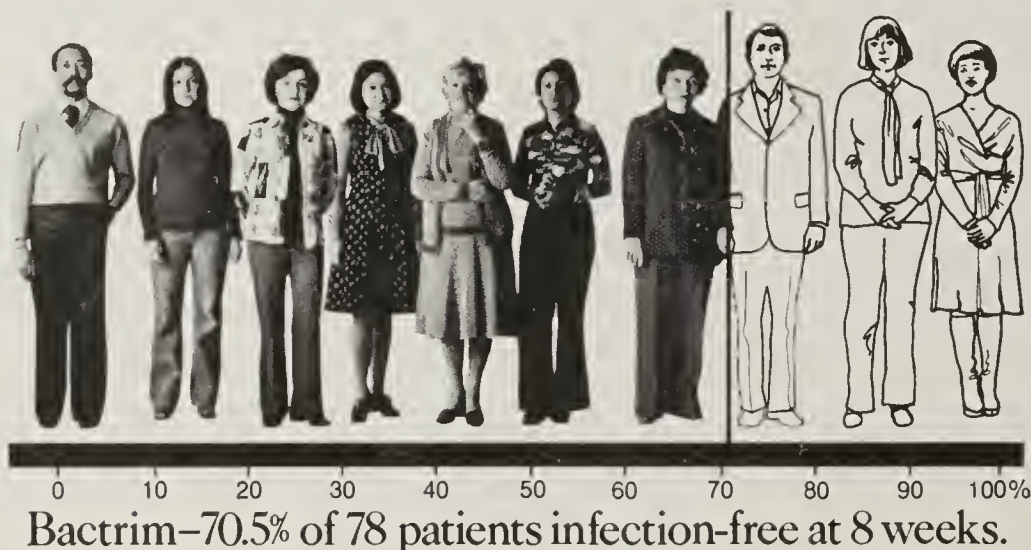


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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma, may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported, should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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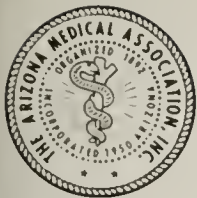
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APRIL 1977/Vol. 34, No. 4

ARIZONA MEDICINE

JOURNAL OF ARIZONA MEDICAL ASSOCIATION

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We are pleased to feature in the Original
Articles section of the Journal papers presented
at the Arizona Regional Meeting of the American
College of Physicians, Phoenix, Arizona, October
29-30, 1976.

Published monthly by The Arizona Medical
Association, Inc., with offices at 810 W.
Bethany Home Rd., Phoenix, Arizona 85013.
Subscription \$20 a year, single copy \$2.00.
Second class postage paid at Phoenix, Ari-
zona, and at additional mailing offices.

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need more red tape

Drug firms challenge
'MAC' rules

Drug
Substitution

The Common Denominator
of Health Progress
RESEARCH

Mailgram

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.



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Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

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Tedral: Adults—One or two tablets every 4 hours. **Children**—(Over 60 lb) one-half the adult dose.

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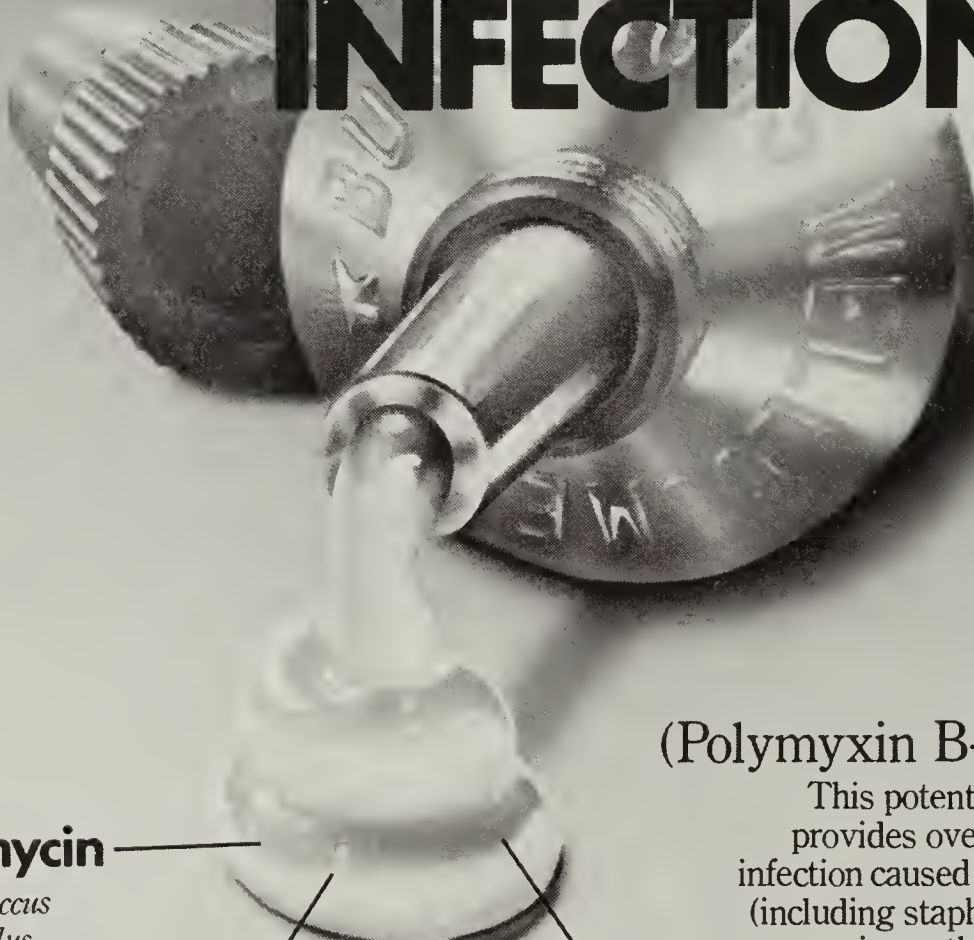
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age requires that potential benefits be weighed against possible hazards to the fetus. Zaroxolyn appears in the breast milk. Not for pediatric use. **Precautions:** Perform periodic examination of serum electrolytes, BUN, uric acid, and glucose. Observe patients for signs of fluid or electrolyte imbalance. These determinations are particularly important when there is excessive vomiting or diarrhea, or when parenteral fluids are administered. Patients treated with diuretics or corticosteroids are susceptible to potassium depletion. Caution should be observed when administering to patients with gout or hyperuricemia or those with severely impaired renal function. Hyperglycemia and glycosuria may occur in latent diabetes. Chloride deficit and hypochloremic alkalosis may occur. Orthostatic hypotension may occur. Dilutional hyponatremia may occur in edematous patients in hot weather. **Adverse Reactions:** Constipation, nausea, vomiting, anorexia, diarrhea, bloating, epigastric distress, intrahepatic cholestatic jaundice, hepatitis, syncope, dizziness, drowsiness, vertigo, headache, orthostatic hypotension, excessive volume depletion, hemoconcentration, venous thrombosis, palpitation, chest pain, leukopenia, urticaria, other skin rashes, dryness of mouth,

hypokalemia, hyponatremia, hypochloremia, hypochloremic alkalosis, hyperuricemia, hyperglycemia, glycosuria, raised BUN or creatinine, fatigue, muscle cramps or spasm, weakness, restlessness, chills, and acute gouty attacks. **Usual Initial Once-Daily Dosages:** mild to moderate essential hypertension—2½ to 5 mg, edema of cardiac failure—5 to 10 mg, edema of renal disease—5 to 20 mg. Dosage adjustment may be necessary during the course of therapy. **How Supplied:** Tablets, 2½, 5 and 10 mg.

References:

- 1 Dornfeld L, Kane R: Metolazone in essential hypertension. The long-term clinical efficacy of a new diuretic. *Curr Ther Res* 18: 527-533, 1975
- 2 Data on file, Medical Department, Pennwalt Prescription Products



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(furosemide) 20 mg and 40 mg

in hypertension.

A brief summary of the Prescribing Information for
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WARNING—Lasix (furosemide) is a potent diuretic which if given in excessive amounts can lead to a profound diuresis with water and electrolyte depletion. Therefore, careful medical supervision is required, and dose and dose schedule have to be adjusted to the individual patient's needs. (See under "Dosage and Administration.")

Indications—Lasix (furosemide) is indicated for the treatment of the edema associated with congestive heart failure, cirrhosis of the liver, and renal disease, including the nephrotic syndrome.

Hypertension—Lasix (furosemide) may be used for the treatment of hypertension alone or in combination with other antihypertensive drugs. Hypertensive patients who cannot be adequately controlled with thiazides will probably also not be adequately controllable with Lasix (furosemide) alone.

CONTRAINDICATIONS—Because animal reproductive studies have shown that Lasix (furosemide) may cause fetal abnormalities, the drug is contraindicated in women of childbearing potential. (See "Additional Information.")

Lasix (furosemide) is contraindicated in anuria. If increasing azotemia and oliguria occur during treatment of severe progressive renal disease, the drug should be discontinued. In hepatic coma and in states of electrolyte depletion, therapy should not be instituted until the basic condition is improved or corrected. Lasix (furosemide) is contraindicated in patients with a history of hypersensitivity to this compound.

Warnings—Excessive diuresis may result in dehydration and reduction in blood volume, with circulatory collapse and with the possibility of vascular thrombosis and embolism, particularly in elderly patients. Excessive loss of potassium in patients receiving digitalis glycosides may precipitate digitalis toxicity. Care should also be exercised in patients receiving potassium depleting steroids.

Frequent serum electrolyte, CO₂, and BUN determinations should be performed during the first few months of therapy and periodically thereafter, and abnormalities corrected or the drug temporarily withdrawn.

In patients with hepatic cirrhosis and ascites, initiation of therapy with Lasix (furosemide) is best carried out in the hospital. Sudden alterations of fluid and electrolyte balance in patients with cirrhosis may precipitate hepatic coma; therefore, strict observation is necessary during the period of diuresis. Supplemental potassium chloride and, if required, an aldosterone antagonist are helpful in preventing hypokalemia and metabolic alkalosis.

Patients should be observed regularly for the possible occurrence of blood dyscrasias, liver damage, or other idiosyncratic reactions.

In those instances where potassium supplementation is required, an oral liquid preparation should be used rather than enteric-coated potassium salts.

There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated thiazides with potassium salts. These lesions may occur with enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides, or certain other oral diuretics.

These small-bowel lesions have caused obstruction, hemorrhage, and perforation. Surgery was frequently required, and deaths have occurred.

Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneously. Therefore, coated potassium-containing formulations should be administered only when indicated and should be discontinued immediately if abdominal pain, distention, nausea, vomiting, or gastrointestinal bleeding occurs.

Patients with known sulfonamide sensitivity may show allergic reactions to Lasix (furosemide).

Precautions—As with any potent diuretic, electrolyte depletion may occur during therapy with Lasix (furosemide), especially in patients receiving higher doses and a restricted salt intake. Electrolyte depletion may manifest itself by weakness, dizziness, lethargy, leg cramps, anorexia, vomiting, and/or mental confusion.

Asymptomatic hyperuricemia can occur and gout may rarely be precipitated. Reversible elevations of BUN may be seen. These have been observed in association with dehydration, which should be avoided, particularly in patients with renal insufficiency.

When parenteral use of Lasix (furosemide) precedes its oral use, it should be kept in mind that cases of tinnitus and reversible hearing impairment have been reported. There have also been some reports of cases in which irreversible hearing impairment occurred. Usually, ototoxicity has been reported when Lasix (furosemide) was injected rapidly in patients with severe impairment of renal function at doses exceeding several times the usual recommended dose and in whom other drugs known to be ototoxic were often given. If the physician elects to use high dose parenteral therapy in patients with severely impaired renal function, controlled intravenous infusion is advisable (for adults, it has been reported that an infusion rate not exceeding 4 mg Lasix [furosemide] per minute has been used).

Increases in blood glucose, and alterations in glucose tolerance tests with abnormalities of the fasting and two-hour postprandial sugar have been observed, and rare cases of precipitation of diabetes mellitus have been reported.

Lasix (furosemide) may lower serum calcium levels, and rare cases of tetany have been reported.

Patients receiving high doses of salicylates, in conjunction with Lasix (furosemide) may experience salicylate toxicity at lower doses because of competitive renal excretory sites.

Diuretics such as furosemide may enhance the nephrotoxicity of cephaloridine. Therefore, Lasix (furosemide) and cephaloridine should not be administered simultaneously.

Sulfonamide diuretics have been reported to decrease arterial responsiveness to pressor amines and to enhance the effect of tubocurarine. Great caution should be exercised in administering curare or its deriva-

tives to patients undergoing therapy with Lasix (furosemide), and it is advisable to discontinue Lasix (furosemide) for one week prior to any elective surgery.

Adverse Reactions—Various forms of dermatitis, including urticaria and rare forms of exfoliative dermatitis, erythema multiforme, pruritus, paresthesia, blurring of vision, postural hypotension, nausea, vomiting, or diarrhea.

Anemia, leukopenia, aplastic anemia, and thrombocytopenia (with purpura). Rare cases of agranulocytosis which responded to treatment.

In addition, the following rare adverse reactions have been reported; however, relationship to the drug has not been established with certainty: sweet taste, oral and gastric burning, paradoxical swelling, headache, jaundice, thrombophlebitis and emboli and acute pancreatitis.

Lasix (furosemide)-induced diuresis may be accompanied by weakness, fatigue, lightheadedness or dizziness, muscle cramps, thirst, increased perspiration, urinary bladder spasm, and symptoms of urinary frequency.

Dosage and Administration

ADULTS

The usual adult dose of Lasix (furosemide) is 20 to 80 mg given as a single dose.

If the diuretic response with a single dose of 20 to 80 mg is not satisfactory, the following schedule should be used: Increase this dose by increments of 20 or 40 mg not sooner than 6 to 8 hours after the previous dose until the desired diuretic effect has been obtained. This individually determined single dose should then be given once or twice daily. The dose of Lasix (furosemide) may be carefully titrated up to 600 mg per day in those patients with severe clinical edematous states.

With doses exceeding 80 mg/day and given for prolonged periods, careful clinical and laboratory observations are particularly advisable.

Hypertension—The usual dose of Lasix (furosemide) is 40 mg twice daily both for initiation of therapy and for maintenance. Careful observations for changes in blood pressure must be made when this compound is used with other antihypertensive drugs, especially during initial therapy. The dosage of other agents must be reduced by at least 50 percent as soon as Lasix (furosemide) is added to the regimen to prevent excessive drop in blood pressure. As the blood pressure falls under the potentiating effect of Lasix (furosemide), a further reduction in dosage, or even discontinuation, of other antihypertensive drugs may be necessary. It is further recommended, if 40 mg twice daily does not lead to a clinically satisfactory response, to add other hypotensive agents, e.g., reserpine, rather than to increase the dose of Lasix (furosemide).

INFANTS AND CHILDREN

Pediatric Administration: The usual initial dose of oral Lasix in infants and children is 2 mg/kg body weight, given as a single dose. If the diuretic response is not satisfactory after the initial dose, dosage may be increased by 1 or 2 mg/kg not sooner than 6 to 8 hours after the previous dose. Doses greater than 6 mg/kg body weight are not recommended.

For maintenance therapy in infants and children, the dose should be adjusted to the minimum effective level.

How Supplied—Lasix Tablets 40 mg (furosemide) supplied as white, round, monogrammed, scored tablets.

Lasix Tablets 20 mg (furosemide) supplied as white, oval, monogrammed tablets.

Note: Dispense in dark containers. Exposure to light may cause slight discoloration which, however, does not alter potency.

Additional Information

Toxicology

The acute toxicity of Lasix (furosemide) has been determined in mice, rats, and dogs. In all three animal species, the oral LD₅₀ of Lasix (furosemide) exceeded 1000 mg/kg of body weight, while the intravenous LD₅₀ ranged from 300 to 680 mg/kg. Intragastric injection of the drug in newborn rats resulted in an LD₅₀ of 380 mg/kg.

The acute toxicity of high doses of Lasix (furosemide) was characterized by convulsions, paralysis, and collapse. Surviving animals often became dehydrated and depleted of electrolytes due to the diuresis induced by Lasix (furosemide). In the newborn rats, intragastric injection of the drug caused hyperactivity and anorexia.

Chronic toxicity studies with Lasix (furosemide) were done in rats and dogs. In a one-year study in rats, renal tubular degeneration occurred, with all doses higher than 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day). A six-month study in dogs revealed calcification and scarring of the renal parenchyma at all doses above 10 mg/kg (83 percent of the maximal recommended human dose of 600 mg per day).

Reproductive Studies

The effects of Lasix (furosemide) on embryonic and fetal development and on pregnant dams were studied in mice, rats, and rabbits.

Lasix (furosemide) caused unexplained maternal deaths and abortions in the rabbit when 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day) was administered between days 12 to 17 of gestation. In a previous study the lowest dose of only 25 mg/kg (2 times the maximal recommended human dose of 600 mg per day) caused maternal deaths and abortions. In a third study, none of the pregnant rabbits survived a dose of 100 mg/kg. Data from the above studies indicate fetal lethality which can precede maternal deaths.

The results of the mouse study and one of the three rabbit studies also showed an increased incidence of hydronephrosis (distention of the renal pelvis and, in some cases, of the ureters) in fetuses derived from treated dams as compared to the incidence in fetuses from the control group.



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Long-Term Trials of Aerosol Triamcinolone Acetonide in Steroid-Dependent Asthma

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INTRODUCTION

Attempts to produce the therapeutic benefit of corticosteroids in asthma, without the side-effects attendant on oral administration, have led to the administration of steroids by aerosol. Early studies met with varying success using hydrocortisone^{1,2} and Prednisolone;³ and, there was no evidence that therapeutic benefit did not ensue from absorption of large amounts of the corticosteroids.⁴

Recently, reports have appeared regarding the efficacy of both aerosol Beclomethasone Dipropionate^{5,7} and Triamcinolone Acetonide^{8,11} in patients with asthma. Experience indicates that these agents induce a beneficial effect without suppression of adrenal function.^{12,13} The present study examines the safety and efficacy of Triamcinolone Acetonide aerosol therapy in a group of steroid-dependent asthmatics over a one-year period.

PATIENTS AND METHODS

Demographic and clinical data for patients participating in this therapeutic trial are shown in Table I. All 29 patients were ambulatory adults, 13 males and 16 females, from 16 to 66 years of age (median age, 47.5 years). The majority of patients (16 cases) had "intrinsic" type airways obstruction; in 12, asthma was classified as "mixed" and in only two cases as "extrinsic". A criterion for entry into the study was that the patient had required for at least six months between 5 and 20 mgs. of prednisone or its equivalent daily (or between 10 and 40 mgs. on an alternate-day basis). Reversibility of obstructive airways disease was demonstrated in each case by at least 15% improvement of expiratory flow after inhalation of Isoproterenol. Excluded were patients with severe or moderately severe concurrent illnesses, such as diabetes mellitus, arteriosclerotic heart disease, or renal dysfunction. No patients with active or quiescent pulmonary tuberculosis were included.

During a one-week baseline period, the usual dose of oral steroids was continued. Regular bronchodilator therapy and other medications were also continued as needed. The FEV₁, the forced vital capacity (FVC), and the mean forced expiratory flow during the middle half of the FVC (FEF_{25-75%}) were measured at the beginning of this baseline period. A control of 8 a.m. plasma cortisol was performed by fluorometric methods once during the baseline week.

After the one week baseline period, the patients were begun on aerosol therapy with Triamcinolone Acetonide, a nonpolar, water-insoluble corticosteroid. This was provided in an alcohol solvent with Freon 12 (dichlorodifluoromethane) as a propellant. Each aerosol inhalation, via an adapter designed to minimize oral de-

position, delivered approximately 100 mcg. of Triamcinolone Acetonide to the airways, with 90% of the particles less than 5 μ in diameter. Patients were instructed uniformly in use of the study aerosol, with actuation of the aerosol valve during a maximal inhalation.

All patients were begun on initial dose of 800 mcg., or two inhalations four times a day, of Triamcinolone. No change in dosage of aerosolized steroid was permitted during the initial 12 weeks of therapy; thereafter, a predetermined maximum of 1600 mcg. daily, or four inhalations four times a day, was established.

Oral steroid dosage remained fixed during the first week of aerosol therapy. Thereafter, oral steroids were reduced at a maximum weekly rate of 3 mg/day of Prednisone, or its equivalent, for patients on every-day therapy or 6 mg/day for those on alternate-day regimens. Individual clinical progress determined the rate and amount of reduction of oral steroid medication.

Spirometric studies and 8 a.m. cortisol levels were repeated periodically throughout the one-year study; and the patients were seen on a regular basis by a member of the investigational team. All cortisol levels, except baseline studies, were measured by radioimmunoassay (RIA).

RESULTS

Only two of the 29 patients did not complete the one-year therapeutic trial of inhaled Triamcinolone. One patient was dropped from the study because of dermatologic problems which prevented dis-

TABLE I. Demographic and Clinical Data on 29 Patients Before Treatment with Triamcinolone Acetonide

PATIENT NUMBER	SEX	AGE	TYPE OF ASTHMA	ORAL CORTICOSTEROIDS	
				Type **	Dose (mg)
1	M	59	I	P	15 mg q.d.
2	F	55	I	P	10 mg q.d.
3	F	59	M	P	10 mg q.o.d.
4	F	58	M	P	10 mg q.d.
5	F	21	I	P	15 mg q.d.
6	M	28	I	P	5 mg q.o.d.
7	M	45	M	P	10 mg q.d.
8	F	38	I	P	5 mg q.d.
9	F	61	I	P	10 mg q.o.d.
10	F	60	M	P	12.5 mg q.d.
11	F	63	I	P	10 mg q.d.
12	F	17	I*	P	15 mg q.o.d.
13	F	65	I	P	12.5 mg q.d.
14 (15)	F	31	I	P	20 mg q.d.
15 (19)	M	49	M	P	10 mg q.d.
16 (20)	M	26	M	P	10 mg q.o.d.
17 (21)	M	61	E	P	5 mg q.d.
18 (24)	M	64	I	P	10 mg q.d.
19 (25)	M	30	E	P	10 mg q.d.
20 (26)	F	37	I	P	10 mg q.o.d.
21 (27)	F	49	I	M	4 mg q.d.
22 (28)	M	56	I	P	15 mg q.d.
23 (29)	F	30	M	P	10 mg q.d.
24 (30)	M	66	M	P	15 mg q.d.
25 (31)	M	49	M	P	10 mg q.d.
26 (32)	F	66	M	P	10 mg q.d.
27 (33)	F	32	I	P	20 mg q.d.
28 (34)	M	53	I	P	5 mg q.d.
29 (35)	M	51	I	F	10 mg q.d.

*I: intrinsic; M: mixed; E: extrinsic.
**P: Prednisone; MP: Methylprednisolone.

continuation of systemic corticosteroids. The second was felt to be unreliable by the investigators, and the efficacy of inhaled steroid could not be adequately evaluated. Data from these two cases is not included in the results since they did not satisfactorily complete the one year trial.

By the conclusion of the study, 21 patients had been able to discontinue oral steroids (Table II); twenty of these patients were no longer on continuous oral steroids within 12 weeks of beginning aerosol therapy. Ten patients in this group required short "bursts" of oral steroids for exacerbations of their asthma; an additional patient resumed oral steroid medications for a brief period because of allergic upper airway symptoms.

In five patients, regular oral steroid use could not be discontinued, but reduced or unchanged dosages were possible with inhaled Triamcinolone. One of these patients was unable to discontinue systemic steroids because of intolerance to withdrawal symptoms (Case 21), and two because of nasal polyposis (Cases 11, 16). The remaining two patients (Cases 14, 13) both had very severe airways obstruction.

Only one patient (Case 17), a patient with purely extrinsic airways obstruction, actually required an increased dose of oral steroid at the end of the one-year study.

The mean oral steroid dose for the entire group fell from a baseline value of 10 mg. of Prednisone daily, or its equivalent, daily to less than 2 mg. after 12 months of inhaled Triamcinolone therapy.

There was considerable variation in aerosol Triamcinolone dose requirement among patients, ranging from 200 to 1600 mcg. per day at the end of the 12-month study as shown in Table II. Only one patient required the predetermined maximum dose of 1600 mcg. per day, and despite this, was unable to discontinue oral steroids. At 18 months, this patient is no longer on oral steroids and has diminished his aerosol steroid dose to 1200 mcg. per day; much of his delayed improvement may be attributable to a nasal polypectomy performed late in the one-year trial. The majority of patients received between 600 and 800 mcg. of the trial drug; the average dose for the group as a whole was 800 mcg. In some cases, dose requirements for Triamcinolone varied at different times according to the severity of asthmatic symptoms.

Baseline 8 a.m. cortisol levels were below normal range in 25 of the 27 patients (Table II). During the course of the 12 month therapeutic trial, all 21 patients who were able to discontinue daily oral steroid use had return of 8 a.m. cortisol levels to within the normal range. In contrast, cortisol values remained low in five of the six patients who had remained on daily oral steroids.

Symptoms, oftentimes severe, which may have been related to steroid with-

TABLE II. CORTICOSTEROID DATA ON 29 PATIENTS BEFORE AND AFTER TREATMENT WITH TRIAMCINOLONE ACETONIDE				
SUBJECT	ORAL STEROIDS BASELINE/FINAL (mgs)	TRIAMCINOLONE AEROSOL INHALATIONS (mcgs)	ADRENAL FUNCTION STUDIES: 8 AM PLASMA CORTISOL BASELINE/FINAL	STEROID WITHDRAWAL SYMPTOMS
* 1	15/0	1200	Low/NL	Fatigue, Dizziness
2	10/0	200	Low/NL	Myalgias, Fatigue
* 3	5/0	800	Low/NL	Myalgias, Mood Changes
4	10/10	800	Low/Low	-----
* 5	15/0	800	Low/NL	Fatigue, Dizziness
6	2.5/0	200	Low/NL	None
7	10/0	800	Low/NL	None
8	5/0	800	NL/NL	Menstrual Irregularities
* 9	5/0	800	Low/NL	Fatigue, Eczema
10	12.5/0	800	Low/NL	Fatigue, Dizziness
11	10/10	800	Low/Low	-----
12	7.5/0	800	Low/NL	None
13	12.5/10	1200	Low/Low	-----
* 14	20/0	1200	Low/NL	Eczema, Fatigue, Myalgias, Depression, Dizziness, Menstrual Irregularities
* 15	10/0	400	Low/NL	None
16	10/7.5	1600	Low/Low	-----
17	5/10	600	Low/NL	-----
* 18	10/0	800	NL/NL	None
20	5/0	400	Low/NL	None
21	5/5	600	Low/Low	-----
22	15/0	600	Low/NL	None
23	10/0	800	Low/NL	Eczema
* 25	10/0	800	Low/NL	Mood Changes, Fatigue, Myalgias
* 26	10/0	800	Low/NL	Fatigue
* 27	20/0	800	Low/NL	Fatigue, Myalgias, Mood Changes
28	5/0	800	Low/NL	Myalgias
* 29	10/0	800	Low/NL	Fatigue, Dizziness, Myalgias

* "Bursts" of oral steroid required for exacerbation of asthma
** "Burst" of oral steroid required for allergic upper airway symptoms

drawal occurred in all but six of the patients tapered off regular oral therapy. The most common complaint in the remaining 15 patients was fatigue, which was present in 10 cases; myalgias, dizziness, mood changes, and menstrual irregularities were also noted by the patients (Table II).

Of the 27 patients who completed the one-year therapeutic trial, 23 demonstrated improvement in FEV₁; 21, in FVC, and 17 in FEF_{25-75%}. (Table III). Mean values for all spirometric parameters increased at one year compared to baseline values. The mean increase in FVC was 26%, which mean FEV₁ and FEF_{25-75%} each rose 35% above baseline values.

Twenty-three patients reported good or excellent subjective response to Triamcinolone aerosol therapy (Table III). Despite lack of significant subjective change in the remaining four patients, three showed improvement in forced expiratory flow rates and three were able to discontinue regular oral steroids while on the inhaled drug.

At the end of the one-year study period, 18 patients had been able to reduce their use of bronchodilators, either inhaled or oral, while receiving the aerosolized steroid. Seven did not significantly change their bronchodilator requirements, while only two had increased their requirements at the conclusion of the therapeutic trial.

Side effects of aerosol Triamcinolone were generally mild and in no case led to discontinuation of the drug. The most frequent side-effect of aerosol Triamcinolone therapy was its effect on the voice

(Table III). Approximately one-half of the patients noted episodic hoarseness. Ten patients complained of sore throats, with Candida being cultured in two cases. Infrequent complaints included chest pain, dry mouth and throat, and fluid retention and dysesthesias.

DISCUSSION

During a one-year therapeutic trial in inhaled Triamcinolone Acetonide in steroid-dependent asthmatics, we found the following:

- (1) Control of asthma by inhaled Triamcinolone with discontinuation of oral steroids was possible in a substantial percentage (78%) of patients.
- (2) Adrenal function returned toward normal, as evidenced by increase in 8 a.m. plasma cortisol levels, upon cessation of daily oral steroid use.
- (3) Significant improvement in airway obstruction, as measured by FEV₁, FVC, and FEF_{25-75%}, occurred in many of the patients.
- (4) Good patient compliance with, and acceptance of, inhaled Triamcinolone therapy was the rule.
- (5) Aerosol therapy with Triamcinolone diminished the bronchodilator requirements of many patients.

The average daily Triamcinolone dose at the end of the therapeutic trial was 800 mcg., compared to an average pre-trial dose of 10 mg of Prednisone (or its equivalent) per day. Thus, an inhaled dose of only 1% of the previous oral requirement (assuming a 4:5 therapeutic ratio of Triamcinolone to Prednisone) was found adequate for asthmatic control in our patients. The absence

TABLE III. PULMONARY FUNCTION SUBJECTIVE RESPONSE, AND SIDE-EFFECTS ON 29 PATIENTS TREATED WITH TRIAMCINOLONE ACETONIDE

SUBJECT	PULMONARY FUNCTION CHANGES BASELINE/FINAL			SUBJECTIVE RESPONSE				SIDE-EFFECTS OF AEROSOLIZED STEROID
	FEV ₁	FVC	FEF 25-75%	EXCELLENT	GOOD	FAIR	POOR	
1	.59/.70	1.71/2.02	.25/.24	X				Sore Throat, Hoarseness
2	1.60/2.00	2.42/2.87	.89/1.20	X				Sore Throat, Hoarseness
3	.61/1.00	1.18/1.42	.27/.50	X				
4	.60/.47	1.11/1.62	.38/.15		X			Hoarseness, Dry Mouth
5	.94/1.90	1.85/3.20	.43/.85			X		Sore Throat
6	2.25/2.50	4.16/4.02	1.32/1.40	X				Hoarseness, Sore Throat, Chest Pain
7	.66/1.00	1.09/2.05	.34/.38	X				
8	1.03/3.00	2.08/3.67	.41/2.90	X				Hoarseness
9	1.08/1.37	1.84/2.70	.63/.46		X			Hoarseness
10	1.14/1.42	2.11/2.97	.57/.47	X				Hoarseness, Fluid Retention
11	1.30/.95	1.84/1.47	.93/.48		X			Hoarseness, Sore Throat, Dry Mouth and Throat
12	1.57/1.50	3.66/3.35	.75/.43	X				
13	.54/.67	1.56/2.17	.23/.15		X			Sore Throat
14	.75/1.02	1.79/2.30	.43/.54	X				Sore Throat, Hoarseness, "Thrush"
15	1.43/2.40	3.03/4.30	.36/.93	X				Dyssesthesias
16	2.47/.60	4.41/1.50	1.29/.28		X			
17	1.33/1.30	2.32/2.47	.72/.48			X		
18	.90/1.65	1.62/3.32	.56/.64	X				
20	.83/1.67	2.07/3.45	.31/.62	X				Hoarseness
21	.74/2.10	1.89/3.02	.34/1.32	X				Hoarseness
22	1.06/2.20	2.02/3.55	.47/1.30	X				Hoarseness, Sore Throat
23	2.32/2.80	4.09/4.20	1.28/1.71	X				Sore Throat
25	.99/.82	2.70/3.00	.43/.26		X			Headaches
26	1.00/1.15	1.72/2.10	.50/.53			X		Hoarseness
27	2.86/3.60	3.46/3.90	2.86/4.00	X				"Thrush"
28	1.98/2.80	3.15/4.10	1.15/1.70	X				Hoarseness
29	.61/2.37	1.18/3.75	.27/1.20	X				Sore Throat

of hypercortisonism observed with the lower inhaled steroids in ordinary therapeutic doses may be attributable to this lower total dose requirement, as well as to their lesser systemic absorption. Prior human studies have demonstrated adrenal cortical suppression and evidence of steroid excess when larger doses of inhaled preparations were used.¹⁴

Mild exacerbations of obstructive symptoms may require an increase in dose of inhaled steroid for patients receiving this medication by aerosol. It is not unexpected that dose requirements should vary, as this is also the case for oral steroids. Severe asthmatic attacks, moreover, should be treated with a course of oral steroids.

A protocol has recently been presented by Dybny¹⁵ which allows for tapering of systemic corticosteroid therapy with minimal withdrawal symptoms and relative safety. This method, which takes into account both baseline and stimulated plasma cortisol levels, as well as subjective response to decreased systemic steroids, might have diminished the incidence of troublesome steroid withdrawal symptoms in our patients.

A recent study¹² with long-term administration of aerosol Beclomethasone Dipropionate demonstrated almost complete recovery of adrenal function within a period of six months in most patients who had previously received prolonged treatment with oral steroids. The authors emphasize, however, that such individuals may require reinstitution of systemic steroids in periods of stress, such as surgery, infection, or trauma. Other in-

vestigations¹⁶ have shown impaired adrenal reserve persisting for several months after cessation of systemic corticosteroid therapy. Supplemental steroid treatment would therefore seem desirable during periods of prolonged stress for at least a year after patients have been tapered off regular oral steroid use.

Understandably, the possibility of adverse local effects secondary to long-term aerosolized steroids has been a cause for concern. Atrophic changes in the upper airways comparable to those observed in the skin after chronic application of topical fluorinated corticosteroids¹⁷ were not observed in any of our patients. To date, however, information regarding the histologic effects of steroid aerosols on the human respiratory mucosa are lacking. Williams et al⁸ have postulated that a local steroid myopathy may be responsible for the effects of Triamcinolone Acetonide aerosol on the voice. Though this possibility is of interest, the problem awaits direct investigation.

It is also possible that daily aerosolized steroid administration may adversely affect defense mechanisms of the respiratory mucosa by altering local immunologic responses. An increased incidence of Candidiasis of the upper airways has been reported in asthmatic patients receiving steroid aerosols.^{18,19} Although in a recent study²⁰ Triamcinolone aerosol was not associated with increased pharyngeal colonization with yeasts, such infections were noted on two occasions in the present study. The clinician should at least be aware of a possible association between

inhalational steroid therapy and local Candida infection.

In summary, although the local long-term side effects of aerosolized steroids remain to be fully elucidated, our experience with inhaled Triamcinolone over a one-year period leads us to believe that this is a safe and convenient mode of therapy for steroid-dependent asthmatics. The beneficial effects of this agent on reversible airways obstruction, unaccompanied by side effects secondary to adrenal suppression, will undoubtedly lead to the more widespread application of aerosolized Triamcinolone in the treatment of reversible airways obstruction.

The authors wish to acknowledge the technical assistance of Mickey Wilson and Sylvia Potter in this study.

BIBLIOGRAPHY

1. Foulde, W.S., Greaves, D.P., Herxheimer, H., and Kingdon, L.D.: Hydrocortisone in Treatment of Allergic Conjunctivitis, Allergic Rhinitis, and Bronchial Asthma, *Lancet*, 1, 234, 1955.
2. Brockbank, W., Brebner, H., Pengelly, C.D.R.: Chronic Asthma Treated with Aerosol Hydrocortisone, *Lancet*, 2, 807, 1956.
3. Peters, G.A., Henderson, L.L.: Prednisolone Aerosol in Asthmatic Bronchitis: Preliminary Report. Progress Staff Meetings Mayo Clinic, 33, 57, 1958.
4. Cotes, P.M., McLean, A., Sayer, J.B.: Absorption of Inhaled Hydrocortisone, *Lancet*, 2, 807, 1958.
5. Brown, H.M., Storey, G., George, W.H.S.: Beclomethasone Dipropionate: A New Steroid Aerosol for the Treatment of Allergic Asthma, *Brit Med J*, 1, 585, 1972.
6. Clark, T.J.H.: Effect of Beclomethasone Dipropionate Delivered by Aerosol in Patients with Asthma, *Lancet*, 1, 1361, 1972.
7. Godfrey, S., and Konig, P.: Beclomethasone Aerosol in Childhood Asthma, *Arch Dis Child*, 48, 665, 1973.
8. Williams, M.H., Kane, C., Shim, C.S.: Treatment of Asthma with Triamcinolone Acetonide Delivered by Aerosol, *Am Rev Respir Dis*, 109, 538, 1974.
9. Williams, M.H.: Treatment of Asthma with Triamcinolone Acetonide, *Chest*, 68, 765, 1975.
10. Failliers, C.J.: Triamcinolone Acetonide Aerosols for Asthma I. Effective Replacement of Systemic Corticosteroid Therapy, *J Allergy Clin Immunol*, 57, 1, 1976.
11. Kriz, R.J., Chmelik, F., doPico, G., Reed, C.E.: A Short-Term Double-Blind Trial of Aerosol Triamcinolone Acetonide in Steroid-Dependent Patients with Severe Asthma, *Chest*, 69, 455, 1976.
12. Spitzer, S.A., Kaufman, H., Koplovitz, A., Topilsky, M., Blum, I.: Beclomethasone Dipropionate and Chronic Asthma, *Chest*, 70, 38, 1976.
13. Spector, S.L., Farr, R.S.: Efficacy of Inhaled Triamcinolone vs. Placebo in Steroid Dependent Asthmatic Patients, *Clin Res*, 23, 352A, 1975.
14. Choo-Kang, Y.F.J., Cooper, E.J., Tribe, A.E., Grant, I.W.B.: Beclomethasone Dipropionate by Inhalation in the Treatment of Airways Obstruction, *Brit J Dis Chest*, 66, 101, 1972.
15. Dybny, R.L.: Withdrawal from Glucocorticoid Therapy, *N.E.J.M.*, 295, 30, 1976.
16. Melby, J.C.: Systemic Corticosteroid Therapy: Pharmacology and Endocrinological Consideration, *Ann Int Med*, 81, 505, 1974.
17. Editorial: Hazards of Potent Topical Corticosteroids, *Lancet*, 1, 870, 1973.
18. Dennis, M., and Iticini, I.H.: Effectiveness and Complications of Aerosol Dexamethasone Phosphate in Severe Asthma, *J Allergy*, 35, 70, 1964.
19. McAllen, M.K., Kochanowski, S.J., Shaw, K.M.: Steroid Aerosols in Asthma: An assessment of Betamethasone Valerate and a 12-Month Study of Patients on Maintenance Treatment, *Br Med J*, 1, 171, 1974.
20. Pingleton, W.W., Bone, R.C., Kerby, G.R., Ruth, W.E.: Oropharyngeal Candidiasis in Patients Treated with Triamcinolone Acetonide Aerosol, *Am Rev Respir Dis*, 113, #4, Part 2, p. 176, 1976.

Costs of Monitoring Chrysotherapy

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Cost and potential toxicity are two factors which may deter both the physician and patient from considering gold therapy for rheumatoid arthritis. In 1975, Liang and Fries¹ presented a cost analysis of alternative monitoring strategies in administering gold. Their data, based on a survey of 10 rheumatologists and 3 hospitals in northern California, indicated that the cost of an initial course of gold therapy was approximately \$800.00. The cost breakdown is shown in Table 1.

A conservative estimate of the number of courses of gold given annually in this country is 100,000. This would place the total national cost for initiating gold at 80 million dollars. It appeared that alternative methods for administering gold could be developed which would be equally safe but would result in less cost to the patient and reduced demands on physician time. Cost reducing measures suggested by Liang and Fries included: 1) decreasing the number of physician visits from weekly to monthly, 2) ordering specific laboratory tests instead of a panel, 3) having the patient check his own urine with a dipstick for protein and occult blood, 4) the use of a self-administered check list for clinical evidence of toxicity which would then be reviewed by a nurse or paraprofessional, and 5) gold injections given by the nurse without physician visits unless there were clinical or laboratory abnormalities.

MATERIALS AND METHODS

Since 1970, our approach to monitoring chrysotherapy has included many features advocated by Liang and Fries. A physician-assistant screens the patient for clinical evidence of gold toxicity. If a rash or stomatitis is present, or if laboratory tests are abnormal, the patient is seen briefly by the physician with no charge made for an office visit. This procedure has resulted in minimal disruption of the physicians' schedule. The physician-assistant then administers gold. Once the decision is made to initiate gold therapy, physician visits are scheduled at four to six week intervals unless problems develop necessitating closer follow-up. A urinalysis is obtained prior to each injection. A complete

blood count (CBC) with platelet estimate is made prior to each injection for the first month, and thereafter before each second or third injection.

RESULTS

We have reviewed our experience with gold therapy administered in 1975 to find the average cost to initiate therapy, and to determine whether our cost-reducing measures in any way increased adverse reactions to gold. Gold therapy was begun in 65 patients in 1975. Fifty patients (77%) completed the initial course with a favorable response. In 8 patients (12%) gold was discontinued because of toxicity. Five

several months later developed a severe rash when she had received a total of 12 mg.

An initial course of gold was considered 1000 mg or the point at which a therapeutic response occurred and maintenance therapy was begun. Administering a course of gold involved an average of five office visits (Table 2). There were 21 injections of gold given. These required 22 urinalyses and 9 CBCs with platelet estimates. The excess of urinalyses compared to gold injections means that on at least one occasion gold was held because of a transient abnormality.

The cost of initiating gold therapy with our modified approach was \$315.00 (Table 1). We did not include the cost of an initial consultation, believing that at this time many problems are explored and decisions made, that it would be unfair to consider this a gold-related cost. In addition, on relatively few occasions was the decision made to begin gold after the first visit. However, to make our figures more directly comparable to the California data, we have added at the bottom our cost of initial consultation bringing the total to \$375.

Table 1
COSTS OF ADMINISTERING GOLD — CONVENTIONAL MONITORING
10 Northern California Rheumatologists and 3 Hospital Clinics

	No.	Charge
Initial visit	1	50.00
Follow-up visit	21	15.00
Gold injections	22	7.00
Urinalyses	20	5.00
CBC and platelet estimates	16	9.00
Platelet counts	12	6.00
TOTAL		\$835.00

patients were lost to follow-up, and two patients were considered treatment failures. Our relatively high response rate may be due to the fact that a number of patients were started on therapy in the last quarter of 1975. As time passes, it is likely that some of these initial responses will not be maintained. Also, some of the patients who were lost to follow-up probably did not return because of poor response. Our low frequency of adverse reactions may reflect only early toxicity. One patient who showed an excellent response at 800 mg,

Our experience with toxicity from courses of gold initiated in 1975 is shown in Table 4. Other than the proteinuria, laboratory tests were not helpful in predicting or confirming the impression of gold toxicity. Two patients had 6% eosinophilia at the time gold was terminated, with absolute eosinophile counts of 360 and 654/mm³. However, this degree of eosinophilia has been reported in patients with active rheumatoid disease². A review of recently published studies on gold therapy²⁻¹⁰ reveals that toxic reactions have

Table 2
EXPERIENCE WITH GOLD, MODIFIED APPROACH

	Mean	Range
Office visits	5	3-10
Gold injections	21	11-35
Urinalyses	22	11-36
CBC with platelet estimate	9	5-19
Gold dose before maintenance therapy	892 mg	485-1365 mg

Presented at the Arizona Regional Meeting of the American College of Physicians, Oct. 29-30, 1976, Phoenix, Az.
Reprint requests to Phoenix Arthritis Center, 4950 E. Thomas Road, Phoenix, Arizona.

The Kidney As An Endocrine Organ

Georgetta Bidwell, M.D.

Introduction

The kidney traditionally has been considered as an exocrine organ concerned with the excretion of waste products of protein metabolism and water. Later complex tubular reabsorptive and secretory processes were the consuming passion of renal physiologists as they sought to determine the fate of filtered sodium, calcium, glucose and other substances. Today a new horizon for the kidney—one that spotlights this organ as a focal point not only for hormone action-interaction, but also as a site of hormone production regulating such important functions as calcium concentration, red blood cell production and vascular tone.

I will not discuss such important endocrine functions of the kidney as hormone catabolism, effects of Growth Hormone, Thyroxine, or cortisone; or even the primary role of PTH, ADH; and Aldosterone on calcium, phosphorus, water, sodium, and potassium handling by the kidney. Rather I would like to focus on substances produced by the renal cells and/or activated within renal cells that have either local or systemic effect.

Discussion

Vitamin D is a steroid hormone activated in the liver and kidney. In the microsomal fractional of the liver vitamin D is hydroxylated in the 25 position to 25 OH D₃.¹ Subsequently it is taken up by the kidney where it is hydroxylated in the 1 position to the active 1,25 OH D₃. This reaction takes place in the renal tubular cell mitochondria in the presence of low intracellular phosphate and PTH.² As is well known, PTH decreases the tubular reabsorption of phosphate, thus enhancing the synthesis of 1,25 OH D₃. The active D₃ then is taken up by intestinal cells, binds to nuclear protein and codes for the production of a calcium binding protein that aids in active calcium absorption from the gut. Bone resorption with calcium release is also enhanced by the 1, 25 OH D₃. Renal conservation of calcium takes place with either the 1,25 or the 24,25 OH D₃. The 24,25 form is synthesized in the presence of

Presented at the Arizona Regional Meeting of the American College of Physicians, Oct. 29-30, 1976, Phoenix, Arizona.
Reprint requests to #308, 500 East Thomas Road, Phoenix, Arizona 85012.

Table 3

COST OF GOLD THERAPY WITH MODIFIED APPROACH

	No.	Charge	Total
Office visits	5	18.00	90.00
Gold injections	21	5.00	105.00
Urinalyses	22	3.00	66.00
CBC and platelet estimates	9	6.00	54.00
			315.00
Initial Consultation			60.00
			\$375.00

Table 4

EXPERIENCE WITH GOLD TOXICITY, 1975

No. Patients	Manifestation toxicity
1	Proteinuria
2	Rash
2	Stomatitis
3	Stomatitis and rash/pruritus
Dose of gold at toxicity	
Mean 480 mg	Range 43-1245 mg

occurred in 7 to 50% of patients; most reports show a frequency of about 30%. We do not suggest that our approach results in less toxicity, but certainly toxicity has not been increased.

DISCUSSION

Presently there is no consensus as to the best method of monitoring gold therapy. In a monograph on rheumatoid arthritis published in 1968, Hill¹¹ stated that "only the physician should administer gold." His monitoring program included a urinalysis before each injection with a CBC every four weeks. Ziff and Baum¹² state, "It is advised that the physician should see the patient at the time of each injection to interrogate" regarding toxicity. They do not specify that the physician must actually administer the gold. Their program calls for weekly urinalyses until 500 mg has been given and then every two weeks; a CBC is advised before every second injection. The manufacturer of a widely prescribed gold preparation¹³ suggests a weekly inquiry regarding clinical manifestations of toxicity, with a urinalysis and CBC every two weeks. There is no specific guide as to who makes the inquiry or who administers the gold.

It is apparent that authorities on gold therapy differ widely in their recommendations as to monitoring strategy. Additional methods for gold administration reflect the experience of respected clinical rheumatologists. Deviations from this pattern have been made chiefly for two reasons: 1) to reduce demands on physician time in a subspecialty already under stress to increase access to health care, and 2) to reduce the cost to patients,

thereby making gold therapy available to those who might otherwise be unable to afford it. If, as indicated by our data, alternative approaches do not increase risk to the patient or detract from gold effectiveness, further exploration for an optimal monitoring regimen appears warranted.

BIBLIOGRAPHY

1. Liang, M., Fries, J.F.: Paper presented at Fourth Western Regional Meeting, American Rheumatism Association, Berkeley, California, December, 1975.
2. Winchester, R.J., Litwin, S.D., Koffler, D., et al: Observations on the eosinophilia of certain patients with rheumatoid arthritis. *Arthritis Rheum* 14:650-665, 1971.
3. Silverberg, D.S., Kidd, E.G., Shnitka, T.K., et al: Gold nephropathy. *Arthritis Rheum* 13:812-825, 1970.
4. Gottlieb, N.L., Smith, P.M., Smith, E.M.: Gold excretion correlated with clinical course during chrysotherapy in rheumatoid arthritis. *Arthritis Rheum* 15:582-592, 1972.
5. Gerber, R.C., Paulus, H.E., Bluestone, R., et al: Clinical response and serum gold levels in chrysotherapy. *Ann Rheum Dis* 31:308-310, 1972.
6. Cooperating Clinics Committee of the American Rheumatism Association: A controlled trial of gold salt therapy in rheumatoid arthritis. *Arthritis Rheum* 16:353-358, 1973.
7. Jessop, J.D., Johns, R.G.S.: Serum gold determinations in patients with rheumatoid arthritis receiving sodium aurothiomalate. *Ann Rheum Dis*, 32:228-232, 1973.
8. Huskisson, E.C., Gibson, T.J., Balme, H.W., et al: Trial comparing D-penicillamine and gold in rheumatoid arthritis. *Ann Rheum Dis*, 33:532-535, 1974.
9. Davis, P., Hughes, G.R.V.: Significance of eosinophilia during gold therapy. *Arthritis Rheum*, 17:964-968, 1974.
10. Gordon, M.H., Tiger, L.H., Ehrlich, G.E.: Gold reactions are not more common in Sjogren's syndrome. *Ann Intern Med*, 82: 47-49, 1975.
11. Hill, D.F.: Gold therapy for rheumatoid arthritis. *Med Clin North Am*, 52: 735, 1968.
12. Ziff, M., Baum, J.: Gold therapy for rheumatoid arthritis. *Arthritis and Allied Conditions*. Edited by J. L. Hollander, D. J. McCarty, Jr., Philadelphia, Lea and Febiger, 1972, p. 473.
13. Schering: Package insert for Solganal*, 1974.

normal phosphate intracellular concentration and normal calcium. The 24,25 form is not active for mobilization of calcium from bone, or absorption from the gut. In renal failure it is believed the hypocalcemia is associated with a decrease in the active 1,25 OH D3 form due to a decreased renal cell mass and increased intracellular phosphate.

Erythropoietin is a substance produced by the juxtaglomerular renal cortical cells in an inactive form which then is activated by a plasma activator located in the alpha 2 globulin fraction of the blood. The localization of the inactive precursor to the JG cell has been determined largely by fluorescent antibody technique.³ The inactive precursor is actively synthesized by the kidney in response to several stimuli, the most important and potent of which is hypoxia.⁴ Normal rabbit kidneys when removed and perfused in vitro in a medium for tissue growth plus perfusate, do not show erythropoietin release as measured by Fe 59 uptake into RBC. If the kidneys are exposed to a three hour hypoxic stimulus prior to the incubation, significant erythropoietin synthesis and release occurs. When puromycin, a known inhibitor of protein synthesis is added to the media, there is a sharp decrease in the Fe 59 uptake indicating that active synthesis was occurring in response to the hypoxic stimulus, and not simply release of a preformed substance.⁵ Erythropoietin stimulates the stem cell to differentiate along the line of erythroid elements and thus increases red cell mass. Stimulation beyond the pronormoblast state does not seem to increase red cell mass, indicating the determination and site of action is prior to the pronormoblast stage. In renal failure it is felt the major cause of the anemia is decreased erythropoietin production by the kidney due to decreased red cell mass.⁵

The juxtaglomerular apparatus is an area within the kidney where the afferent, efferent arteriole, the distal tubule and the glomerulus are in close proximity. The afferent arteriole's medial layer contains epithelioid cells which produce over ninety percent of the renin released in the body. The next major contribution within the kidneys is from the Macula Densa, a group of cells in the distal tubule with very dense nuclei.

Renin substrate is a glycoprotein synthesized in the liver and found in the alpha 2 globulin fraction of plasma. Renin substrate is increased in patients taking estrogen containing contraceptives. This increased renin substrate is believed to be the contributing factor to the hypertension associated with oral contraceptives.

Renin is an enzyme of 40,000 molecular weight. It catalyzes the conversion of renin substrate to Angiotensin I by cleaving a leucine leucine bond. Angiotensin I is then rapidly converted in the presence of Converting Enzyme in tissue vascular beds

to Angiotensin II, a potent vasoconstrictor.⁶ Importantly there is an Angiotensinogenase which rapidly inactivates this potent vascular constrictor — avoiding severe tissue ischemia. With respect to renal autoregulation of renal blood flow, it is believed that local release of renin and Converting Enzyme within walls of the afferent arterioles may act as a transient vasoconstrictor influence responding acutely to changes that mediate renin release, which is quickly dissipated by the Angiotensin II Inactivator; thus preventing under normal circumstances severe persistent renal ischemia.⁷

One of the most important documented functions of renin is to stimulate the release of aldosterone from the Zona Glomerulosa of the adrenal gland. Aldosterone then acts on the distal renal tubule to enhance the distal tubular reabsorption of sodium and the excretion of potassium.

Summary

Extracellular fluid depletion, decrease in renal artery pressure, increase in sympathetic tone, or norepinephrine, stimulate the JG apparatus, particular the epithelioid cells of the afferent arteriole, to release renin which acts on renin substrate to stimulate the production of Angiotensin I which then rapidly converts to Angiotensin II, that both stimulates arteriolar vasoconstriction and the release of aldosterone, in turn which stimulates renal sodium retention, extracellular fluid expansion and return of renal arterial pressure and volume, thus inhibiting the stimulus to renin release.

Prostaglandins have long been hormones in search of a function. Renal prostaglandins are twenty carbon unsaturated lipid acids with a five membered ring. Locally the hormone is synthesized from polyunsaturated fatty acids in the microsomal fraction of the collecting tubular cell of the renal medulla and released from the endoplasmic reticulum into the cytoplasm or extracellular fluid of the renal medulla.⁸ PGE2, one of the most potent and important of the renal prostaglandins acts to oppose both neuro and humoral vasoconstriction.⁹ Thus there is an intrarenal mechanism for increasing renal blood flow without changing GFR. Bradykinin acts in concert with PGE2 by stimulating its synthesis and release from the renal cell. Interestingly, the enzyme which inactivates prostaglandins is a 15 OH dehydrogenase located in the renal cortex. With the anatomic separation within the kidney of areas designated as sites of production and inactivation of PGE2, the kidney possess a self contained packet for the intrarenal control of renal blood flow.

Current theories of essential hypertension now center around the kidney as a key organ with defects in the depressor systems as a possible source of the increased vascular reactivity. Kallikrein is a pepti-

dase that is produced in the kidney. activates kinnogen to yield active kinin: one of the most active of which bradykinin—an eight amino acid peptide. Bradykinin is a potent vasodilatory agent that does not appear to require alpha beta receptor sites. In patients with essential hypertension the kallikrein peptide excretion in urine is subnormal.¹¹ Furthermore, sodium restricted diets—2 Gm. Diets—in essential hypertensive patients increase the renal excretion of kallikrein into the normal range.¹² Thus, there seems to be some evidence for a defect in a depressor substance being present in a population of essential hypertensive patients. More research into this area is obviously required to elucidate the complex interrelations between prostaglandins, bradykinin and renin. Clearly labelling the basis of essential hypertension as falling into a category related purely to defects in either the vasoconstrictor or vasodilatory systems is an oversimplification.

In conclusion we can see in addition to being a major site of excretion of end products of protein metabolism, water and various toxins both endogenous and exogenous, and being a prime target organ for hormones such as PTH, ADH, and Aldosterone, the kidney is a source of hormone production and a key to hormone modulation.

BIBLIOGRAPHY

1. Blunt, J.W., and DeLuca, H.F.: The synthesis of hydroxycholecalciferol. A biologically active metabolite of vitamin D. *Biochemistry* 8:671, 1969.
2. DeLuca, H.F.: The kidney as an endocrine organ involved in the function of vitamin D. *Am J Med* 58:39, 1975.
3. Busuttil, R.W., Roh, B.L. and Fisher, J.W.: Cytological localization of erythropoietin in the human kidney using the fluorescent antibody technique. *Proc Exp Biol Med* 137:327, 1971.
4. Zanjani, E.D., McLaurin, W.D., Gordon, A.S., Rappaport, I.A., Gibbs, J.M., and Gidari, A.S.: Biogenesis of erythropoietin; role of substrate for erythropoietin. *J Lab Clin Med* 77:751, 1971.
5. Erslev, A.: Renal biogenesis of erythropoietin. *Am J Med* 58:25, 1975.
6. Bakhle, Y.S.: Converting enzyme in vitro measurement and properties. Page, J.H., and Bumpus, F.M. (eds.) *Angiotensin*. Springer Verlag Inc., New York, New York, 1974 pp 41-80.
7. Thurnau, K.: Intrarenal action of angiotensin. In Page, J.H. and Bumpus, F.M. (eds.): *Angiotensin*. Springer Verlag Inc. New York, New York, 1974, pp 475-489.
8. Muirhead, E.E., Germain, G., Leach, B.E., Pitcock, J., Stephenson, P., Brooks, B., Brosius, W.L., Daniels, E.G., and Hinman, J.W.: Production of renal medullary prostaglandins by renal medullary interstitial cells grown in tissue culture. *Circ Res* 31:Suppl. 2:161, 1972.
9. Daniels, E.G., Hinman, J.W., Leach, B.E. and Muirhead, E.E.: Identification of prostaglandin E2 as the principal vasodepressor lipid of rabbit renal medulla. *Nature (London)* 215:1298, 1967.
10. Melmon, K.L. and Cline, M.J.: Kinins. *Am J Med* 43:153, 1967.
11. Margolius, H.S., Horwitz, D., Pisano, J.J. and Keiser, H.R.: Urinary kallikrein excretion in hypertensive man. *Circ Res* 35:820, 1974.
12. Margolius, H.S., Horwitz, D., Geller, R., Alexander, R.W., Gill, J.R., Pisano, J.J. and Keiser, H.R.: Urinary kallikrein excretion in normal man. *Circ Res* 35:812, 1974.

Macrophage Phagocytic Function and Dysfunction

Anton G. Axline, M.D.

Phagocytosis has long been a source of great fascination to biologists. In 1883, Elie Metchnikoff initiated experiments into the study of phagocytosis by inserting a splinter into starfish larvae and observing the organism's response. This was the first in a long series of elegant experiments that led to recognition that the process of phagocytosis plays a central role in cell-mediated host defense against and response to foreign substances. Since those early experiments, we have made much progress in our understanding of the process of phagocytosis and of the structure and function of phagocytic cells. Phagocytic mechanisms and the dysfunction syndromes of mononuclear phagocytic cells are the subjects of this report.

Mononuclear phagocytic cells are the principal components of the reticuloendothelial system and represent a spectrum of cells that all have a common origin in the bone marrow. They circulate briefly as monocytes and then migrate to tissue sites where they differentiate into structurally more complex and functionally more active macrophages.^{1,2} In the liver, the macrophage becomes the Kupffer cell, in the lung the differentiated cell becomes the alveolar macrophage and in other tissues it becomes the histiocyte or epithelioid cell. Despite these various names, mononuclear phagocytic cells represent a single cell line with a common origin. Whatever differences exist among the various members of the reticuloendothelial system, their biologic significance is, in large measure, a reflection of their special ability to engage in extensive phagocytic activity.

The phagocytic process and the intracellular events that are triggered by it are the result of a complex series of interactions involving the outer cell surface, plasma membrane, lysosomal system, microfilaments, microtubules, Golgi apparatus, mitochondria and cytoplasmic components. To understand these processes and their dysfunctions, it is useful to divide the entire phagocytic process and associated events into several distinct phases.

1. Chemotaxis
2. Particle attachment
3. Particle interiorization
4. Centripetal flow
5. Fusion of phagosome and lysosomes
6. Bactericidal activity
7. Digestion

Presented at the Arizona Regional Meeting of the American College of Physicians, Phoenix, Arizona, October 29-30, 1976.

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CHEMOTAXIS

Macrophages are attracted to areas of need by specific and nonspecific mechanisms. Altered protein which is found in an area of inflammation is a strong chemotactic stimulus for macrophages. In addition, lysates of neutrophils exert a specific attractive force for monocytes. Polymorphonuclear leukocytes release their contents during phagocytic and killing events and in this way call monocytes into the area of inflammation. Certain bacteria release substances that are capable of attracting phagocytes. However, the activation of the complement system by microbes and their products plays a central role in formation of chemotactic activity. The active components of special interest are C3a and C5a which can be generated in a number of ways. Antibody to surface components of the microbe can react to form an antigen-antibody complex that activates the hemolytic complement components C1, C4 and C2. These, in turn, attack C3 and C5 in the serum to yield the chemotactic peptides C3a and C5a. Alternatively, certain microorganisms with or without antibody may generate C3a and C5a in serum by activating the alternate complement pathway, the properdin system. Some bacteria are capable of producing proteases that can attack C3 or C5 directly to form C3a and C5a.³ Aggregating platelets and certain damaged tissues are also able to release proteases that cleave C3 and C5 to form C3a and C5a. Other substances that are chemotactic for monocytes include lymphokines produced by lymphocytes in response to antigen stimulation,⁴ serotonin, kallikrein, and plasminogen activator.

Defective Monocyte Chemotaxis

Defective chemotaxis resulting from abnormally functioning or absent complement components has been described in a number of patients. These defects include genetic deficiencies of C2 and C3,⁵ depletion of C3 secondary to acute glomerulonephritis, systemic lupus erythematosus, or cirrhosis,⁵ or dysfunction of C5. Defective chemotaxis can also occur in patients with acute or chronic infections due to the presence of inhibitors that interfere with complement generation.⁶

Monocytes from patients with Wiskott-Aldrich syndrome have been reported to exhibit a deficient chemotactic response to the complement component C5a.⁷ It has been suggested that this results from overproduction of a factor produced by lymphocytes (lymphocyte-derived chemotactic factor) that attaches to the surface of monocytes. Defective chemotaxis is one of

several immunologic defects that have been demonstrated for patients with chronic mucocutaneous candidiasis. Similar deficiencies have been described for patients with Chediak-Higashi⁸ and "Lazy Leukocyte" syndromes. Defective monocyte chemotaxis has also been observed in Hodgkin's disease,⁹ some types of cancer, particularly melanoma, certain adenocarcinomas and sarcoma. Patients who have been treated with adrenocorticosteroids, and patients with herpes simplex or influenza viral infections have also been reported to exhibit abnormalities of macrophage chemotaxis.

PARTICLE ATTACHMENT

After the macrophage and the material to be engulfed have come into contact, the actual process of phagocytosis can begin. This is initiated by attachment of the particle to the macrophage at one or more of several functionally distinct receptor sites. The cell surface of the macrophage possesses receptor sites for C3 which permit the cell to accommodate complement coated particles.¹⁰ It also contains receptors for the Fab portion of immunoglobulins.¹⁰ In addition the cell surface contains non-specific particle recognition receptors which permit attachment of latex particles, denatured proteins, and certain other types of particulate matter.¹¹ Macrophages also possess receptor sites for both T and B lymphocytes that are not dependent upon specific antigenic stimulation.

Defective Particle Attachment

In a preliminary assessment of patients with combined immunodeficiency, *in vitro* studies showed decreased monocyte adherence to glass, abnormal surface morphology, reduced monocyte spreading, and only infrequent lymphocyte-monocyte contact.¹² These data suggest, but do not prove, that defects in attachment between macrophage and foreign particles can occur.

PARTICLE INTERIORIZATION

For an understanding of the process of particle interiorization, we are indebted to the work of Cohn¹³ and Hirsch.¹⁴ They provided morphologic evidence that particle engulfment is achieved by a series of invaginations and/or evaginations of plasma membrane. First a slight indentation at the site of particle attachment develops and then a deep pouch is formed as the particle is surrounded by plasma membrane. Ultimately the particle is completely surrounded by plasma membrane which then fuses with itself, pinches off, and forms a vacuole made up of plasma membrane turned "inside out." The particle is then fully contained within the pouch now referred to as a phagocytic vacuole or phagosome.

Rabinovitch¹¹ showed that the requirements for particle ingestion were distinctly separate from those for particle attachment. Calcium was shown to be required for particle interiorization but not for

attachment. Stossel¹⁵ extended these findings by carefully quantitating the effects of divalent cations. Calcium, magnesium, manganese or cobalt were all shown to stimulate particle uptake, and both calcium and magnesium were required for maximal uptake. He also showed that for certain particles the complement system was required. Serum opsonic activity involved C3 fixation to the particle. This could be generated by the properdin pathway as well as by the classical complement activation system. Opsonization of particles markedly diminished the concentration of divalent cations required for maximal rate of particle uptake. These data suggest that divalent cations and heat-labile opsonins stimulate the work of ingestion and heat-labile opsonins act by potentiating the effects of divalent cations.

The process of particle uptake is quite selective in that ingestion of one particle does not trigger generalized phagocytosis of all particles attached to the cell membrane, but rather the phagocytic stimulus is confined to the segment of the cell's plasma membrane immediately adjacent to the particle being ingested.¹⁶ Thus the macrophage exhibits substantial selectivity in the ingestion phase of phagocytosis.

Formation of the endocytic vacuole, cell movement involved in chemotaxis, attachment of cells to a substratum, and maintenance of cell shape all require extensive translocation of plasma membrane. Although the precise mechanisms are incompletely understood, recent studies have suggested that contractile microfilaments may participate in plasma membrane movement.¹⁷ The macrophage contains an organized system of 40-50A microfilaments in specific association with the subplasmalemmal region of newly forming phagocytic vacuoles. These microfilaments are composed of actin, myosin, an actin-binding protein, and perhaps other components that form a contractile network. Evidence that these structures are involved in phagocytosis is provided by the observation that treatment of macrophages with cytochalasin B, a fungal metabolite, reversibly interferes with phagocytosis and also disrupts microfilaments.

Defects in Particle Interiorization

Hyperosmolar conditions inhibit ingestion and may account for impaired particle uptake by leukocytes in patients with diabetic acidosis.

Boxer and Stossel¹⁸ recently reported a patient with abnormalities in function of the actin-myosin system of granulocytes. The cells exhibited abnormalities of movement, inability to extend pseudopods, defective chemotaxis, and a markedly reduced phagocytic capacity. The discovery of abnormalities in contractile mechanisms which can be related to defects in phagocytic function provide a framework for new approaches to the investigation of phagocytic dysfunction.

CENTRIPETAL FLOW

Following particle interiorization, the phagosome migrates centripetally into the interior or centrosphere region of the cell. This form of movement occurs in all phagocytes, but is particularly pronounced in the mononuclear phagocyte. The mechanism of centripetal flow is not certain although it has been suggested that microtubules may play a role. There are no known phagocytic functional defects attributable to deficiency of centripetal flow.

FUSION OF PHAGOSOME AND LYSOSOMES

In the centrosphere region the phagosome comes into contact with pre-existing primary and/or secondary lysosomes. It is not known if such contact results from direct motion or random collision. After contact has been made, the phagosome fuses with one or more lysosomes to form a membrane-bounded phagolysosome. As a result of fusion the phagocytized material is brought into contact with the hydrolytic enzymes and other contents of the lysosomal system. It is at this stage that the particle can be regarded as being truly intracellular. Fusion occurs very rapidly after particle uptake and the extent of fusion is directly proportional to the amount of material interiorized by the cell.¹⁹

Defective Phagosome-Lysosome Fusion

Patients with Chediak-Higashi syndrome contain giant lysosomes that have been reported to exhibit selective impairment of fusion with phagosomes.⁸ This results in a functional myeloperoxidase deficiency that may account for the bactericidal defect seen in these patients.

Jones and Hirsch²⁰ provided morphologic evidence that phagosomes containing live *Toxoplasma gondii* organisms exhibit decreased fusion relative to phagosomes containing dead toxoplasma or other organisms. This suggested that one mechanism by which toxoplasma remain viable intracellularly is by inhibiting the process of fusion. Similar suggestions have been made for macrophages following ingestion of live *Mycobacterium tuberculosis* or *Chlamydiae*.

It has been suggested that adrenocorticosteroids may affect the process of fusion of lysosomes with phagosomes. The suggestion is based on observations with isolated lysosomes in which adrenocorticosteroids "stabilized" the lysosomes as manifested by a delay in leakage of lysosomal contents. However, there are no confirming data that adrenocorticosteroids "stabilize" lysosomes of intact cells or that they alter rates of fusion of phagosomes and lysosomes.

MICROBICIDAL ACTIVITY

Once the particle is enclosed within the phagolysosome the cell is able to initiate the microbicidal activity. The mechanisms by which monocytes kill microorganisms is

not fully understood. However, hydrogen peroxide, myeloperoxidase and halides play a partial role.²¹ Molecular oxygen reduced to superoxide radical by oxidative mechanisms that use either NADH or NADPH. Superoxide is then further reduced to form hydrogen peroxide which then interacts with myeloperoxidase and a halide—either chloride or iodide—to form an aldehyde which is lethal for a number of microorganisms. This mechanism has been shown to operate as a bactericidal mechanism in polymorphonuclear leukocytes and in certain, but not necessarily mononuclear phagocytic cells.

Monocytes, unlike polymorphonuclear leukocytes, have not been shown to contain cationic substances which are bactericidal for organisms.

Defective Monocyte Microbicidal Activity

Patients with chronic granulomatous disease exhibit deficiencies in mononuclear phagocytic cell as well as in polymorphonuclear leukocyte cell function. The most likely mononuclear cell defect in chronic granulomatous disease is deficient phagocytic hydrogen peroxide production.²² A subset of patients with hereditary glucose-6 phosphate dehydrogenase deficiency exhibit a defect in bactericidal activity.²²

Another phagocytic cell defect is that of deficiency of myeloperoxidase. Leukocytes from such patients are unable to effectively kill certain bacteria or fungi. Acute myelogenous leukemia and some patients with lymphoma show normal phagocytosis, but a failure to inhibit intracellular replication. The specific chemical defect involved in these patients is not known with certainty although one patient with myelomonocytic leukemia was reported to have a myeloperoxidase deficiency.

In addition to documented macrophage bactericidal defects, abnormal mononuclear cell function has been thought to occur in several other disorders. Patients who fail to control intracellular parasites adequately must be suspected of having defective macrophage defense systems. Therefore, patients with lepromatous leprosy, miliary tuberculosis, and disseminated fungal infections may be considered as possibly having macrophage dysfunction syndromes. However, in these disorders intrinsic or acquired defects of macrophage function or of macrophage lymphoid interaction have been inferred but not proven.

Malignant diseases of the lymphoid and reticuloendothelial systems are associated with an unusually high incidence of infection with intracellular organisms many of which are nonpathogenic or are of a low-grade pathogenicity for normal individuals. For example, infection with *Listeria monocytogenes* or *Candida albicans* occurs with unusually high frequency in patients with reticulum cell sarcoma.

Hodgkin's disease, and chronic lymphocytic leukemia. Although abnormalities of cellular or humoral immune responses are well documented in such disorders, it is difficult to know whether these are critical factors resulting in opportunistic infection or whether related phenomena such as granulocytopenia, indwelling venous catheters, immunosuppressant or adrenocorticosteroid therapy are most important.

Antifungal and staphylococcal activity in circulating blood monocytes *in vivo* have been shown to be diminished by treatment with adrenocorticosteroids.²⁴ Decreased clearance by macrophages of staphylococci aerosolized into lung have been found following treatment with ozone. It has been suggested that this occurs by interference with killing mechanisms.

DIGESTION

The final step in the phagocytic process is digestion of the material interiorized. Certain particles are digested rather completely within cells. On the other hand, some particles are never digested and are retained within the macrophage lysosomal system until the death of the cell. A good example of the latter is a tattoo in which the carbon particle remains associated with the macrophage for the life of the individual. The rate of digestion for bacteria varies quite remarkably depending upon whether the material is interiorized. For *Staphylococcus albus* the half-life for degradation of protein to the level of amino acids or peptides is approximately 22 hours whereas for *Bacillus subtilis* the half-life for protein degradation is 6 hours. Various carbohydrate and lipid components of ingested microbes may be degraded at much different rates than the protein. Thus, rates of digestion of endocytized material are dependent on the composition as well as the complex chemical environment in which that material exists.

Intracellular Digestion Defects

Several inborn errors of metabolism resulting in diminished or abnormal lysosomal enzyme activity have been identified.²⁵ The congenital defect of a lysosomal hydrolase will cause the accumulation in the lysosomal system of all substances whose degradation is dependent upon the missing enzyme. Mononuclear phagocytic cells as well as other cell types store the completely digested material in large vacuoles.

Examples of lipid metabolism defects resulting in lipid-laden macrophages are Gaucher's, Niemann-Pick, Tay-Sachs, Farber's, and Fabry's diseases, sulfatide lipidoses, and metachromatic leukodystrophy. Similarly, examples of mucopolysaccharidoses which result in engorged lysosomal vacuoles are the glycoses types I - VI, Hurler's syndrome, Pseudo-Hurler's syndrome, α -mannosidase deficiency, and mucopolysaccharidosis.

It has recently been reported by Odegaard²⁶ that azathioprine decreases the intracellular digestion of bacteria. Whether this plays any role clinically is unknown.

ACKNOWLEDGEMENTS

Supported by the Medical Research Service of the Veterans Administration.

BIBLIOGRAPHY

1. van Furth, R. and Cohn, Z.A.: The origin and kinetics of mononuclear phagocytes. *J Exp Med* 128:415, 1968.
2. Volkman, A.: Monocyte kinetics and their changes in infection, in Nelson, D.S. (ed): *Immunobiology of the Macrophage*. New York, Academic Press, Inc., 1976, pp 291-322.
3. Ward, P.A., Chaplin, J., Conroy, M.C. and Lepow, I.H.: Generation by bacterial proteinases of leukotactic factors from human serum, and human C3 and C5. *J Immunol* 110:1003-1009, 1973.
4. Altman, L.C., Snyderman, R., Oppenheim, J. and Mergenhagen, S.E.: A human mononuclear leukocyte chemotactic factor: characterization, specificity and kinetics of production by homologous leukocytes. *J Immunol* 110:801-810, 1973.
5. Rosen, F.S., Alper, C.A. and Janeway, C.A.: The primary immunodeficiencies and the serum complement defects, in Nathan, D.G. and Oski, F.A. (eds): *Hematology of Infancy and Childhood*. Philadelphia, W. B. Saunders, 1974.
6. Ward, P.A.: Natural and synthetic inhibitors of leukotaxis, in Lepow, I.H. and Ward, P.A. (eds): *Inflammation: Mechanisms and Control*. New York, Academic Press, 1972, pp 301-307.
7. Altman, L., Snyderman, R. and Blaese, R.: Abnormalities of chemotactic lymphokine synthesis and monocyte leukocyte chemotaxis in Wiskott-Aldrich syndrome. *J Clin Invest* 54:486, 1974.
8. Gallin, J., Klimerman, J., Padgett, G. and Wolff, S.: Defective mononuclear leukocyte chemotaxis in the Chediak-Higashi syndrome of humans, mink, and cattle. *Blood* 45:863, 1975.
9. Ward, P. and Berenberg, J.: Defective regulation of inflammatory mediators in Hodgkin's disease: supernormal levels of chemotactic factor inactivator. *N Engl J Med* 290:76, 1974.
10. Lay, W.H. and Nussenzweig, V.: Receptors for complement on leukocytes. *J Exp Med* 128:991, 1968.
11. Rabinovitch, M.: Phagocytosis: the engulfment stage. *Semin Hematol* 5:134, 1968.
12. Albrecht, R.M. and Hong, R.: Basic and clinical considerations of the monocyte-macrophage system in man. *J Pediatr* 88:751-765, 1976.
13. Cohn, Z.A.: The metabolism and physiology of the mononuclear phagocytes, in Zweifach, B.W., Grant, L. and McCluskey, R.T. (eds): *The Inflammatory Process*. New York, Academic Press, 1965, pp 323-353.
14. Hirsch, J.G.: Phagocytosis. *Annu Rev Microbiol* 19:339-350, 1965.
15. Stossel, T.P.: Quantitative studies of phagocytosis: kinetic effects of cations and heat-labile opsonin. *J Cell Biol* 58:346-356, 1973.
16. Griffin, F.M., Jr. and Silverstein, S.C.: Segmental response of the macrophage plasma membrane to a phagocytic stimulus. *J Exp Med* 139:323-336, 1974.
17. Axline, S.G. and Reaven, E.P.: Inhibition of phagocytosis and plasma membrane mobility of the cultivated macrophage by Cytochalasin B: role of subplasmalemmal microfilaments. *J Cell Biol* 62:647-659, 1974.
18. Boxer, L.A., Hedley-Whyte, E.T. and Stossel, T.P.: Neutrophil dysfunction and abnormal neutrophil behavior. *N Engl J Med* 291:1903, 1974.
19. Pesenti, E.L. and Axline, S.G.: Phagolysosome formation in normal and colchicine-treated macrophages. *J Exp Med* 142:903-913, 1975.
20. Jones, T.C. and Hirsch, J.G.: The interaction between *Toxoplasma gondii* and mammalian cells. II. The absence of lysosomal fusion with phagocytic vacuoles containing living parasites. *J Exp Med* 136:1173, 1968.
21. Stossel, T.P.: Phagocytosis. *N Engl J Med* 290:774-780, 1974.
22. Baehner, R.L., Johnston, R.B., Jr., and Nathan, D.G.: Comparative study of the metabolic and bactericidal characteristics of severely glucose-6-phosphate dehydrogenase-deficient polymorphonuclear leukocytes and leuko-

cytes from children with chronic granulomatous disease. *J Reticuloendothel Soc* 12:150-169, 1972.

23. Leher, R.J. and Cline, M.J.: Leukocyte myeloperoxidase deficiency and disseminated candidiasis: the role of myeloperoxidase in resistance to *Candida* infection. *J Clin Invest* 48:1478-1488, 1969.

24. Rinehart, J., Sagone, A., Balcerzak, S., Ackerman, G. and LoBuglio, A.: Effects of corticosteroid therapy on human monocyte function. *N Engl J Med* 292:236, 1975.

25. Hers, H.G. and Van Hoof, F.: Genetic abnormalities of lysosomes, in Dingle, J.T. and Fell, H.G. (eds): *Lysosomes in Biology and Pathology* 2. Amsterdam, North-Holland Publishing Co., 1969, pp 19-40.

26. Odegaard, A.: The effect of azathioprine on mononuclear blood cells cultured *in vitro*. *Acta Pathol Microbiol Scand* 83:74, 1975.

Additional references are available upon request.

ARIZONA MEDICINE

Address all correspondence to the
Journal Offices
810 W. Bethany Home Rd.,
Phoenix, Arizona 85013

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2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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6. Reprints will be supplied to the author at printing cost.

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It's Here Again

Entrapment

The illicit flow of drugs from doctors and pharmacies is now under intensive investigation by the U.S. Department of Justice Drug Enforcement Administration. A special strike force has been formed by the DEA using undercover informers and if you think that you are safe just be doubly careful in your prescription to new patients regardless of how thoroughly you examine them.

One physician in San Francisco has been brought up for illegal prescribing of drugs when the drug prescribed was not a narcotic. It was prescribed in a number of forty-eight total. He did examine the patient and did all the regular things but the undercover agent was so skillful that she mislead the doctor completely and he must answer therefore to the great white father.

Director Besinger recently stated that the "new program has been identifying doctors and druggists who illegally divert drugs to addicts".

The information is secured by well-schooled undercover agents who present themselves to private offices. The physicians may or may not have examined the new patient thoroughly but the undercover agent seems to always come away with the illicit prescription.

So it won't happen to you! Well, let me just say that when I came to the Valley in 1950, two of the most respected physicians of Phoenix had been entrapped by similar methods except that the entrapment was done by an agent who was simulating an

attack of asthma and always wanted de-erol. There are a host of other drugs besides narcotics which the DEA is concerned about.

The warning is clear. If in doubt about new patient's complaints, be very careful about what you prescribe and how much and whether or not it is a drug that would easily converted to illicit use by other individuals.

J. W. Kennedy, M.D.

No person can be said to enjoy civil liberty who has no share in legislation, and person is secure in society unless the laws known and respected.

Noah Webster (17



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President's Page

Annual Report of the President 1976-1977

As the 85th year of existence of the Arizona Medical Association draws to a close, it is gratifying to observe that most of the physicians of Arizona are continuing to meet the problems of providing quality health care with unity, organization, success and guarded optimism. The outstanding example of this, of course, has been the sponsorship and incorporation of the Mutual Insurance Company of Arizona, providing a strong new approach to professional liability protection. At least the advancing ravages of the malpractice disease have been checked, and we seem to be in a period of remission. With tort law reforms and a new and vital insurance program underway, we are continuing to explore other parameters of therapy through our crisis committee, to hopefully achieve a permanent cure.

Two grants, shared by the Arizona Medical Association and the University of Arizona College of Medicine, give further evidence of the salutary effects of unified

effort by the physicians of our State. The Arizona Perinatal Program, continues to demonstrate the feasibility of providing the most sophisticated and expert care to high risk mothers and infants from throughout our large land area. The newer grant, only recently received, for the development of an Arizona Health Service Corps, to provide for adequate health care in under-served areas, contains equal promise of success with the joint cooperation of physicians from all over the State.

Our public relations program is thriving and we have seen a favorable image of us presented in the various media throughout the state. Legislators seek out and are influenced by our opinions of matters relating to health and disease. Our program of continuing medical education has not only had a salutary effect on public opinion but should also serve to satisfy the new requirements of continuing education for licensure renewal. With the tabulated support of our membership, *Arizona Medicine* is undergoing changes and improvements as a very viable state medical publication. Through our physicians rehabilitation committee we are continuing our work in helping some of our unfortunate colleagues regain their health and professional standing. All of our standing committees are functioning in their areas of responsibility as the annual reports indicate. All of this is perhaps reflected in the continued success and attendance at our annual meeting and scientific assembly.

To remain successful, ArMA must continue to be efficient and effective. This year the concept of zero-based budgeting was

introduced and should help to insure the use of our financial resources on an annual basis. With this system, there are no carry-over budgeted funds; all money proposed to be spent must be justified from the first dollar on up every year for every program capital account. This will help to guarantee efficiency in our operations. Our executive staff has taken up this concept enthusiastically as they do in all their support activities. Thus, they help to guarantee effectiveness, and despite their heavier and heavier responsibilities, they remain cordially and personally available to every member physician. They are truly the backbone which helps to keep ArMA standing straight.

I think it might prove very interesting and enlightening if we kept a time log for one year of all the hours Arizona physicians have voluntarily contributed to the varied and complex activities of our state association. I'm sure the total would be staggering! We other group of people, professional or otherwise, give as freely and gratuitously of their time and talents as physicians—for the ultimate purpose of providing better health care for more people.

As president, I had the opportunity and privilege of meeting with eleven of fourteen county societies. Despite the rapidly increasing numbers of physicians in the state to serve our expanding population and the increasing complexity and number of serious problems facing all of us, I gained the impression that we are becoming better acquainted and more aware of our common good, no matter where we practice. Differences of opinions arise and often heat

ussions ensue at times, temporarily curing the common goals for which we all live. In the end, however, we find as reasonable people that we are all trying to provide, by the best of our efforts, the best medical care available anywhere in the world. We must continue to meet together and talk together and work out our problems together—urban and rural, specialist and generalist, liberal and conservative. It is only in this manner that we have been so successful in the past. Together we can face the future, without flinching, under the able leadership of our new president, Edward Sattenspiel, M.D.

Edward Sattenspiel, M.D.
President



**Clinical Oncology
In Arizona**

Role of the Medical Oncology Social Worker

Sherry W. Johnson, M.A., M.S.W.

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EDITOR'S NOTE:

Increasing awareness of the many different problems facing patients and families of patients with cancer has led to the implementation of more flexible and more comprehensive cancer rehabilitation programs in many hospitals and cancer centers around the country. In 1975, the Section of Hematology and Medical Oncology in the Department of Internal Medicine at the University of Arizona Health Sciences Center, in order to more adequately meet the psychosocial

needs of its rapidly growing patient population, recruited Ms. Sherry Johnson, a psychiatrically trained social worker, to join its staff. Ms. Johnson has become an indispensable member of our health care team in meeting the total needs of patients with cancer.

In this month's column, Ms. Johnson describes her role in our Section and provides us with some insight into some of the non-medical factors which should be considered in the care of the patient with cancer.

INTRODUCTION

With many types of cancer, the outlook for prolonged life after diagnosis has improved over the years. This has occurred as a result of better diagnostic methods, increased public awareness of the importance of early diagnosis, and improved treatments. In many types of cancer, treatment is given with curative intent. However, despite these medical successes (reflected by statistics on improved disease-free intervals and prolonged survival), many non-medical problems must be addressed. For example, the patient who has had definitive treatment and is hopefully "cured" of cancer must still face the possibility of recurrence of disease, as well as adjusting to the permanent cosmetic and/or functional effects caused by treatment, and dealing with society's prejudices regarding cancer (manifested in such practical problems as difficulty in obtaining employment or life insurance). The patient whose disease cannot be cured may face, in addition, the stresses of either prolonged illness or perhaps the realization that he may soon die. In individual cases, these nonmedical problems may be overwhelmingly important to the success or failure of treatment. Thus, incorporation of an approach to the psychosocial needs of the patient and his family, with efforts directed toward interpretation of these needs to the individuals responsible for the patient's medical care and others with whom the patient must interact, is essential. Although concerned nurses and doctors can offer support in this area, the medical social worker is specially trained to deal with these problems and is available on a full-time basis to staff and patients for consultation.

In describing my efforts as outpatient medical social worker for the Section of Hematology and Oncology at the University of Arizona Health Sciences Center, I hope to convey some idea of the potential scope of medical social work as it is ideally practiced today and the contributions the social worker can make in improving the total care of the patient and his family. For purposes of discussion, I have identified and considered separately four interrelated roles: a) patient and family counselor; b) member of the medical oncology team; c) leader of the medical oncology staff group; and d) consultant and educator.

A. Patient and Family Counselor

As a medical social worker, my primary objective is helping patients and their families to deal with the emotional and social problems which may result from chronic and/or terminal illness, hospitalization, and disability. Initial contact with the patient is made in the Hematology/Medical Oncology outpatient clinic, through case finding, referral by a member of the medical or nursing staff, or at the request of the patient or one of the patient's family members or friends. Referrals are encouraged for a number of different reasons (see Table 1).

Through evaluation and counseling of a patient, I attempt to delineate those psychosocial factors such as social roles, interpersonal relationships, emotional responses, and social resources which may affect a patient's response to his illness (or which may be affected by his illness or disability), and to identify *with the patient* areas for intervention. The key to helping a patient is not always in changing his culture or environment or even in curing or arresting his disease, but rather it may be in helping him to understand his emotional reactions and their consequences and helping him to see other options which may be available. By accepting the patient's perception of himself and his situation with sensitivity and understanding, the social worker strives to provide an atmosphere or relationship in which the patient will feel comfortable in revealing emotions (such as fear, anger, guilt, hostility) which are frequently suppressed in the presence of family members or medical staff. The goal is to help the patient to free himself from such disabling forces and to develop or regain a sense of self-esteem, and the ability to assert himself in a more constructive way so that he can cope more effectively with personal and family life situations even in the face of death. In some cases, counseling of the patient together with his family or perhaps family members alone is indicated.

The following examples may serve to illustrate some of these concepts.

A major concern of many patients with cancer is how other people such as their spouse, children, or employer, will respond to their illness and many of these patients may make certain inaccurate assumptions which directly affect how they relate to these other people. For example, women who have undergone mastectomy are often fearful of disfigurement and anxious about being less feminine. It would not be unlikely for this type of patient to misinterpret an innocuous comment from her male partner as an affirmation of his "rejection" of her. In reality, her partner is usually more concerned with her health than her physical appearance. One joint counseling interview may help to alleviate many of the patient's fears and misperceptions, and facilitate more open

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Table 1

General Indications for Obtaining Social Service Referral or Consultation

1. Patients expressing multiple somatic complaints without sufficient medical basis should be evaluated for depression.
2. Patients or spouses expressing undue feelings of loneliness, fear, hostility, or isolation due to illness, chemotherapy, prognosis, lengthy hospitalization, etc.
3. Patients resistant to or unable to adhere to medical recommendations for treatment.
4. Patients experiencing sexual dysfunction.
5. Patients who live alone (any age).
6. Patients experiencing problems of living (e.g., employment, housing, transportation, money).
7. Patients or spouses who have experienced one or more of the following events/losses:
 - employment; forced retirement; medical leave
 - divorce or separation
 - death of significant other (spouse, parent, other relative)
 - surgery and/or chemotherapy resulting in loss of body part or change in body image
 - adolescents emancipating from parents
 - recent move to Tucson
 - lack of support from family or friends.
8. Patients requiring plans for continuing care at home or in a nursing home, etc.
9. Patients who are terminally ill who may desire assistance in making plans for a will, mortuary arrangements, care/guardianship of children, etc.
10. Patients requiring a spokesman within the hospital or with outside agencies.
11. Offer of counseling services to spouses and other family members of deceased patients.

communication between the patient and her partner.

Other patients may assume that because they have cancer their employer will think that they are no longer capable of handling their job and any suggestions from the employer regarding work performance are interpreted as proof of this. In cases such as this, the task is to examine and to clarify with the patient the extent to which he is projecting his own fears of inadequacy upon his employer.

Problems of role reversal due to prolonged illness may often result in family dysfunction. For example, a man who can no longer work to support his family may suffer loss of confidence and feelings of guilt and inadequacy. Correspondingly,

the wife may experience anger over the changes she must make and the additional responsibilities she must assume, as well as fear over the potential loss of her spouse. In these situations, I try to assist the couple in identifying and understanding their feelings, expectations, and patterns of behavior as they relate to communicating and living within the context of a life-threatening illness.

In addition to individual and family counseling, assistance in reducing the stresses in a patient's living situation may be provided by locating and utilizing appropriate personal and community resources such as home health care and homemaker services. Frequently, referrals to ease a patient's financial burdens are made to the Arizona chapters of the American Cancer Society and Leukemia Society, as well as to the U. S. Department of Social Security and the Arizona Department of Economic Security. When necessary, patients and families are referred to attorneys who will assist with wills and guardianship of children and mortuaries that will help patients and families make funeral arrangements.

Although, as stated previously, evaluation and counseling is conducted on an outpatient basis, the understanding of the patient's psychosocial needs gained during these sessions is also of great importance in reducing the patient's anxiety and in providing continuity and integration of care should the patient become hospitalized.

B. Member of Medical Oncology Team

As is implied above, the oncology social worker in collaboration with the medical oncologists, house staff, nursing staff, and other members of the health team participates in the development, implementation, and evaluation of an effective treatment plan. The personal, family, employment, and educational history obtained by the social worker facilitates the medical team in maintaining a total patient perspective. The insight obtained with regard to the patient's emotional reaction to his disease can be of special assistance to the team in discerning the best alternatives to the patient's care, since, in general, patients cope with stress after the diagnosis of cancer as they have characteristically throughout their lives. Hence, the oncology social worker's specialty is to be the generalist on the team—to be active in assisting the team to identify and communicate treatment objectives and a plan of care which conceptualizes multiple causalities of behaviors.

For example, physicians are frequently bewildered and frustrated by a patient who is reluctant to accept or flatly refuses treatment which, from the physician's point of view, is the best means possible of maintaining the patient's survival. The physician may even feel anger toward the

patient who, in his perception, is sabotaging his attempts to cure or control cancer. However, the patient may indirectly communicating to the physician his feelings of hopelessness and despair. Perhaps submitting to treatment means acknowledging having cancer, or a recurrence, withstanding increasing medical bills, or needing to take a week's absence from work after each course of treatment. The patient's resistance to treatment may be a very positive attempt to preserve emotional, financial, or social well being. In these situations, the social worker serves as the patient's advocate and urges the team to involve him more in decisions regarding his treatment plans. For example, belligerency on the part of patient or a family member or use of staff as a scapegoat may really be manifestation of the anxiety and anger regarding the patient's loss of control over what is happening to him or the uncertainty of his quality of life. By interpreting this to the staff and helping the staff understand and ventilate their own feelings, the social worker provides a basis for alternative suggestions which actively involve the patient in decisions and reduce the anxiety and agitation of both patient and the staff.

C. Leader of Medical Oncology Staff Group

In addition to their awareness of the importance of total care for the patient, most of our oncologists have acknowledged their awareness of the emotional needs of the oncology team and the importance of maintaining good communication between team members. The medical oncologist, social worker and charge nurse of the inpatient unit serve as facilitators of a weekly staff group meeting which is geared to assist all staff (i.e., attendings, medical house staff, nurses, and allied health professionals) to deal with their fears and feelings of inadequacy and the constant stress of caring for dying patients. Additional problems related to division of labor and negotiation of roles may also be resolved in discussions between various staff members. For example, when nursing roles overlap, the social worker may indicate that role assignment is not merely an issue of who has the skills, but who desires to do what, and who the patient wants to assist him. The purpose of the group is to provide an empathetic and accepting atmosphere where staff can express their real feelings and work together toward a more productive staff. We believe that patient care is maximized by the existence of this staff group which deals with the feelings resulting from the care of cancer patients.

D. Consultant and Educator

Support for the cancer patient and family must extend beyond the patient's medical oncology doctors, nurses,

ial worker. The medical social worker has a commitment to sensitize and educate other health professionals within the medical center and the community, as well as the community at large, to the unmet psychosocial needs of these patients and to work with other health professionals to identify and mobilize existing or needed resources and structures. Through participation in training programs for medical staff, nurses, and allied health students in conferences, seminars, and teaching rounds, planned courses within

the University and community, and consultation with other health professionals, the opportunity to work toward fulfilling this objective is provided.

For example, the general public is often uncomfortable in discussing cancer openly or in dealing with its related social problems such as death. Hopefully, courses such as the one I am currently teaching to University students on death and dying and others being offered in the community can provide a forum to address these issues.



Seminars in Endocrinology and Metabolism

INFERTILITY

Part II: Causation and Therapy

TIMOTHY BURNS, M.D.

Continuing with the present issue of Arizona Medicine is the series of articles titled "Seminars in Endocrinology and Metabolism." The purpose of these short review articles is twofold. First, due to the rapid proliferation of new knowledge in the field of endocrinology and the multiple tests available for their evaluation, short, clinically oriented reviews would enable the physician to keep abreast of these newer developments as they relate to their practice. In addition, with great stress being placed on voluntary recertification in many specialties, reviews such as they should serve as an authoritative, succinct teaching forum. The editors will endeavor to accomplish these goals by utilizing the talents of practicing physicians as guest contributors to this series. Feedback, both positive and negative, is encouraged in order to help fulfill these objectives.

Marshall B. Block, M.D., Editor

Using the five screening procedures previously presented, the cause of infertility can be determined in 90% of couples. Further investigation may require adjunctive testing such as laparoscopy (10-30% margin of error patency tests); immunologic, specific serologic, and genetic evaluations (antibodies are very probably a cause of infertility in some couples, despite parent testing); or testing for various endocrine or systemic disorders.

Ovarian factors causing infertility may be primary or secondary and are predominantly related to anovulation and oligo-ovulation. Absolute evidence of ovulation can be determined only by direct visualization or by subsequent pregnancy after presumptive evidence is documented by the above test (i.e., temperature recordings, progesterone levels, etc.). Anovulation may occur as a result of an ovarian, pituitary or hypothalamic defect. If anovulation is a result of ovarian failure such as premature menopause or ovarian dysgenesis, no ova are present in the ovary and attempts to induce ovulation will be futile. Ovarian failure is suggested by the total absence of estrogen effect on the cervical mucus, abnormal vaginal cytology or lack of withdrawal response to progesterone, but is best diagnosed if gonadotropin levels are measured and found to be in the menopausal range. Primary or secondary ovarian abnormalities are also often the cause of infertility in patients with oligo-ovulation and irregular menses. This syndrome is usually the result of mild imbalance in hormone production or regulation and may be caused by polycystic disease of the ovary, adrenal or thyroid disease or by mild derangements of the hypothalamic-pituitary-ovarian axis.

Whatever the degree of ovulatory failure, the treatment for all of these patients is similar. Three therapeutic regimens are available for ovulation induction and are implemented in successive stages until ovulation occurs. First, clomiphene citrate is administered in progressive dosages. Clomiphene acts by blocking endogenous estrogen and by negative feedback causes an outpouring of LH and FSH which in turn stimulates the ovarian follicle. If it is

In cooperation with other existing agencies such as the American Cancer Society and the Leukemia Society, additional opportunities are provided for myself and other medical social workers to educate the public. Ideally, concomitant with increased public awareness will come mobilization of the community to better coordinate existing services, increase expenditures, and implement new, more comprehensive programs in cancer care.

ineffective, a regimen of clomiphene citrate followed by human chorionic gonadotropin (HCG) is tried. The luteinizing hormone action of HCG may be needed for ovulation after follicular maturation is attained by stimulated gonadotropins. If there is still no response, human menopausal gonadotropins (HMG) are administered. Patients responding to HMG have a gonadotropin deficiency originating on the hypothalamic or pituitary level. Pituitary or hypothalamic tumor must be ruled out as the cause for gonadotropin deficiency. Before HMG is administered one must be certain that the ovaries are able to respond. Patients who fail to respond to clomiphene may be potentially capable of ovulation and gonadotropin levels are sufficient. Included in this group are patients having polycystic ovarian disease and should be considered for bilateral ovarian wedge resection.

Corpus luteum defects are thought to be caused by progesterone deficiency and supplementation is the current mode of treatment.

Other endocrinopathies may also be responsible for affecting the ovary. Hypothalamic disorders, such as the amenorrheagalactorrhea syndromes which involve elevated prolactin levels, interfere with ovulation. Hypothyroidism and occasionally hyperthyroidism may also be related to anovulation.

Tubal and peritoneal pathology are responsible for 30% of cases of infertility. The results of surgery for correction of tubal pathology have been notoriously poor.

Uterine causes of infertility are rare. Such abnormalities include didelphic uterus, bicornuate uterus, septate uterus, uterine synechiae and uterine fibromyomas.

Cervical problems causing infertility are primarily due to cervicitis and its affect on cervical mucus and sperm survival.

Causes of infertility in the man are investigated if the semen analysis is abnormal. Genetic causes include Klinefelter's, male Turner's and Reifenshtein's syndromes. Gonadal dysfunction and primary testicular disease include cryptorchidism, the Sertoli cell only syndrome (germinal cell hypoplasia), testicular agenesis, orchitis resulting from epidemic parotitis, seminiferous tubular sclerosis after gonorrhea and myotonia dystrophica.

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Cited from: Clinical Symposia, Vol. 28:5, 1976

When FSH levels are high, as they are in many of these disorders, primary testicular failure is suggested and very little can be done to enhance fertility.

Endocrine imbalances may cause infertility as a result of decreased levels of pituitary gonadotropins. Normal spermatogenesis requires adequate levels of FSH to initiate the functioning of the seminiferous tubules. LH must also be available to initiate (and maintain) spermatogenesis via testosterone. Kallman's syndrome is a rare syndrome in which hypogonadotropic (FSH and LH deficiency) hypogonadism is associated with anosmia and may include midline defects such as a cleft lip or palate. These patients do not enter puberty because of deficiencies in FSH and LH. Therapy for Kallman's syndrome involves administration of HMG (which contains FSH) and HCG (which contains LH) to occasionally stimulate spermatogenesis. Administration of testosterone will encourage development of secondary sex characteristics. Fertile eunuchism is seen in patients who have an isolated LH deficiency. Azoospermia and low testosterone levels are the result of the LH deficiency. Delayed puberty is clinically difficult to distinguish from Kallman's syndrome. The possibility of lesions such as a craniopharyngioma must be excluded. Panhypopituitarism will result in impotence and decreased libido as well as in the loss of secondary sex characteristics. Before therapy is begun in post-pubertal panhypopituitarism the possibility of a causative intracranial lesion must be eliminated. Hypothyroidism may cause a low sperm count and infertility; the sperm count will rise in response to therapy. Adrenal insufficiency may, in addition to typical findings, be associated with gonadal failure. Congenital adrenal hyperplasia may be suspected in the adult male presenting with decreased sperm count only. Cushing's disease and cirrhosis of the liver may also cause a low sperm count, in addition to more classic symptoms.

A varicocele may be defined as a varicosity of the spermatic vein and is one of the major correctable causes of male infertility.

Certain medications and drugs can cause infertility in the male and be classified into two groups on the basis of whether their chief effect is on potency and ejaculation or on spermatogenesis. The former include narcotics, alcohol, tranquilizers (e.g., phenothiazines), MAO inhibitors and drugs which interfere with autonomic nervous system (e.g., guanethidine and methyl-dopa) and are thus associated with retrograde ejaculation. Drugs that affect spermatogenesis are amebicides, antimalarial drugs, nitrofurantoin and chemotherapeutic agents.

Ductal obstruction is often present in cases of azoospermia where the testicular biopsy is normal. It may be caused by

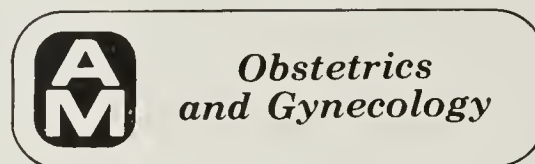
infections (e.g., tuberculosis), in competence of the vas deferens (congenital or secondary to cystic fibrosis), or previous ligation of the vas.

Male infertility of uncertain etiology may be related to oligospermia, poor motility (may occur as a result of infection) or high semen volume (of which, prostatitis is a correctable cause).

If infertility in the male cannot be treated, artificial insemination with a specimen provided by a donor may be considered. This procedure poses moral, legal and many psychological ramifications. Other couples in whom infertility cannot be treated successfully may wish to consider adoption. At present, a couple

may have to wait years before they adopt a child.

In conclusion: The fertility rate for infertility patients, irrespective of etiology, is approximately 50%. The prognosis obviously vary according to the etiology. Those female infertility patients who become pregnant, pregnancy wastage increased over that in normal con-populations and the incidence of ecto-pregnancy is about five times the normal rate. Spontaneous abortions are also increased and even the perinatal mortality doubled in some series. Therefore, an infertile patient who is so fortunate to conceive should not be treated as an ordinary pregnant patient but watched carefully throughout her pregnancy.



**Obstetrics
and Gynecology**

The DESAD Project

**Vaginal and Cervical Cancers and
Other Abnormalities Associated with
Exposure In Utero To Diethylstilbestrol
and Related Synthetic Hormones**

Donald J. Ziehm, M.D., Editor

The subject of diethylstilbestrol (DES) exposure *in utero* is a familiar one. The National Cancer Institute's Division of Cancer Control and Rehabilitation is directing a study in four institutions, called the DESAD project, of DES-associated vaginal and cervical irregularities and the rare instances of clear-cell adenocarcinoma that occur in DES-exposed daughters.

The following text of the Information for Physicians-DES Exposure In Utero paper was compiled by the physicians of the DESAD Project's Professional and Public Relations Subcommittee, and edited by the Office of Cancer Communications of the National Cancer Institute. This information is very important to every physician in this country who is at all likely to be contacted concerning DES exposure *in utero*.

I. What Is Diethylstilbestrol (DES)?

DES (Diethylstilbestrol or stilbestrol), a synthetic estrogen-type hormone, was synthesized in the late 1930's. During the 1940's many physicians throughout the United States and other countries prescribed this substance for pregnant women. Several studies suggested that in complicated pregnancy such as bleeding, threatened miscarriage, or diabetes, this treatment improved salvage of the fetus.

Although its use in pregnancy has been discontinued, DES remains a useful agent for certain menopausal symptoms, certain cases of carcinoma of the breast and prostate, and a few other clinical problems.

II. Why Were DES-Type Drugs Used in Pregnancy?

Nearly one pregnancy in five resulted in a spontaneous abortion. Various studies suggested that DES-type drugs given to women were likely to have miscarriages decreased and the incidence of abortion. Additional investigation indicated that pregnant women with more than one prior miscarriage, diabetes, toxemia of pregnancy could also be helped from DES administration. These findings were widely publicized during the 1940's and 1950's, and prenatal administration of DES-type drugs was extensive.

Later studies disclosed that the administration of DES to pregnant women

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tion of DES during pregnancy was less effective than initially thought. Additional clinical research and development of newer compounds gradually diminished their use.

II. What is the Cancer Problem Associated with *In Utero* Exposure?

In 1971, Drs. Arthur L. Herbst, Howard H. H. Elder and David Poskanzer at Massachusetts General Hospital and Harvard Medical School reported a link between maternal DES therapy during pregnancy and the later occurrence of clear-cell adenocarcinoma of the vagina in female offspring exposed to the drug *in utero*. This initial report was soon confirmed by others. Soon after the discovery of the initial cases, a Registry of Clear-Cell Adenocarcinoma of the Genital Tract in Young Females was established by Dr. Herbst and Robert E. Scully with support from the National Cancer Institute and the American Cancer Society. It now contains varying amounts of data on almost 300 cases from the United States and abroad. Registry address is MARP, Room 303, 5841 Maryland Avenue, Chicago, Illinois 60610.

The patients have ranged in age from 7 to 20 years at the time of diagnosis.

Documentation of exposure to DES-type hormones has been established in two-thirds of the fully investigated case histories. Of the vaginal adenocarcinoma cases, more than 80 percent are known to have been exposed to DES-type hormones.

Because DES-type hormones were not administered to some of the mothers of these cancer patients, factors other than maternal hormone administration also may play a role in the etiology of these cancers.

In all cases for which precise treatment schedules are available, the drug was initiated before the 18th week of gestation. Dosages and duration of therapy varied widely. However, as little as 1.5 mg. DES administered daily throughout pregnancy was found in one case history to be associated with subsequent cancer in female offspring. Administration of the drug in varying amounts for a week or more during the first trimester also was associated with the subsequent development of cancer.

Cancers related to DES-exposure have not been reported in male offspring.

Although the exact number of pregnant women treated with DES or chemically similar compounds during pregnancy is not known, it has been estimated to be as many as two million. The risk of developing adenocarcinoma in exposed females under 20 years of age appears to be minimal, in view of the large exposed population and the very rare incidence of the disease so far reported. However, as exposed females grow older, the incidence of cancer related to DES-type drugs may change.

V. Noncancerous Irregularities

Early in their investigation, Dr. Herbst and his associates noted that most of the vaginal and cervical cancers in the exposed

females were associated with vaginal adenosis (the presence of glandular epithelium in the vagina). Benign adenosis is found histologically in over 97 percent of vaginal clear-cell adenocarcinomas, whether or not a history of DES-type drug exposure *in utero* is confirmed. Vaginal adenosis is rare in normal (unexposed) young women.

The results of examinations of females exposed *in utero* to DES-type drugs have been reported in several studies. More than a third of those who were exposed in the first four months of gestation have vaginal adenosis, and more than two-thirds have cervical ectropion (the presence of glandular tissue on the portio vaginalis of the cervix).

Other abnormalities seen in these examinations, such as transverse vaginal and cervical ridges, also may be associated with intrauterine exposure to DES-type drugs. These are described by a variety of names—hood, pseudopolyp, rim, collar, cockscomb cervix.

V. If the Patient was Exposed to DES-Type Drugs, What Should be Done?

All asymptomatic girls who were exposed *in utero* should receive a thorough pelvic examination at menarche or if they have reached 14 years of age. Younger girls should be examined if they develop abnormal bleeding or discharge. Whenever prenatal exposure is probable, and there are symptoms of discharge, further investigation is imperative, regardless of the patient's age. This investigation should not be concluded until it is certain that no lesion is present.

Before the examination is undertaken, the entire procedure should be thoroughly discussed with the patient (and her mother or father if she is a minor). The examination should include inspection and palpation, Papanicolaou smear (cervix and vagina), and an iodine staining test of the entire cervix and vagina. Abnormal areas, including those that do not stain with iodine, should be biopsied. This procedure can be performed in the physician's office with small biopsy instruments and without significant discomfort.

For the very young patient who has symptoms that require investigation, anesthesia may occasionally be required before an examination. A small speculum permits adequate visualization of the vagina without undue discomfort in younger patients.

With asymptomatic females, if adequate examination is not possible at the initial visit, vaginal tampons should be used for a few months to allow an adequate examination later without discomfort.

Colposcopy is a useful adjunct to this examination, but it is not essential. Utilizing its low power magnification to examine the vagina and cervix, the physician can identify areas of glandular tissue (adenosis) in the vagina or on the cervix. This identification permits directed rather than "blind" biopsies. Used in conjunction with the iodine staining test and selected biopsy,

colposcopy permits precise recording of observed abnormalities and their appraisal at fixed intervals.

VI. Followup Examinations

The patient exposed to DES-type drugs should be followed on a regular basis. After a normal initial examination, annual pelvic examinations with cervical and vaginal cytology and iodine staining are probably adequate. If any abnormalities are noted during the initial evaluation, more frequent followup examinations are suggested (every 3 to 6 months, depending on the severity of the findings).

VII. Management of Vaginal and Cervical Irregularities Other than Clear-Cell Adenocarcinoma

Locally destructive measures such as cauterization, cryosurgery, or excision can be utilized if atypical changes such as marked squamous dysplasia or carcinoma *in situ* of the vagina or cervix are found on biopsy.

Optimal management of nonmalignant lesions in females exposed to DES-type drugs *in utero* is uncertain. At the present time, no case has been reported in which vaginal adenosis has progressed to cancer under direct observation. Careful followup appears at present to be the most prudent approach to DES-exposed subjects without carcinoma.

There is no evidence to date indicating that use of oral contraceptives by the DES-exposed population would be undesirable. However, they add further hormonal variables to a complex situation and are one more aspect of the problem requiring more information.

The presence of adenosis is not a contraindication to future pregnancy if the woman desires to have children.

VIII. Cancer Diagnosis

The cancers reported in the Registry have been found more often on the cervix or upper anterior vaginal wall than elsewhere. They usually are elevated, soft and friable, with a tendency to invade surrounding tissue early and metastasize through the lymphatic system. The ratio of vaginal to cervical site of origin (classification of the Cancer Committee of the International Federation of Gynecology and Obstetrics) has been approximately two to one.

IX. CANCER THERAPY

Decisions regarding mode and extent of therapy in these young women are difficult in themselves and further complicated by emotionally charged issues. Both surgery and high energy radiotherapy potentially can cure the disease. Cancers associated with DES-type drugs may develop in young women primarily in tissues of Mullerian origin—the upper portion of the vagina and the cervix.

Treatment should be highly individualized and is best accomplished by physicians experienced in treating gynecologic cancers.



Advances in the Treatment of Lung Cancer Interstitial Implants

Kent J. Rossman, M.D.

This continuing series of articles entitled "Seminars in Chest Medicine" will attempt to keep the reader abreast of developments in the broad field of pulmonary diseases. The format used will be that of brief succinct reviews written by the editors as well as guest contributors. Areas of controversy as well as practical chest medicine will be explored. We hope that these reviews will be of value in promoting continuing education for certification examinations as well as a forum for new and controversial issues. The editors welcome comments and discussion from our readers.

Robert J. Clark, M.D.
Lynn M. Taussig, M.D.
William C. Weese, M.D.

An unnecessary pessimism clouds the treatment of lung cancer. In at least 50% of newly diagnosed patients, the cancer has already extended beyond the confines of the lung, either to the mediastinal lymph nodes or other organ systems. Even when the cancer is apparently initially limited to the lung, the natural course is, for many of these patients, to develop metastatic disease later. However, localized lesions of the lung treated by radical excision, by lobectomy or pneumonectomy, can result in cure. Although the surgical approach yields only a 30% cure rate, it is much better than the 5% five-year survival of all patients with lung cancer.

It is, therefore, discouraging to receive a patient who has a lesion that appears to be small and potentially curable by surgery but who, for reason of chronic lung disease with pulmonary insufficiency, cannot tolerate resective surgery. Also discouraging is the

patient who has other medical contraindications to lobectomy or pneumonectomy but who, nevertheless, would be able to withstand the physiological consequences of pulmonary resection.

There is a second group of unresectable patients. They are medically able to undergo resective thoracotomy but, at time of exploration, their initial lesion is too extensive to permit complete removal. There may be chest wall invasion, fixation of the tumor to hilar structures, or intimate adherence to a major vessel. Finally, there is a third group of patients who have received external radiation in high doses as primary treatment but who later develop local recurrence of tumor. Although this occurrence is rare, it is particularly vexing. This patient, now two or three years after initial diagnosis, has no other evidence of metastatic disease and is potentially curable.

These three groups of patients are now amenable to treatment with interstitial implantation of the tumor by a radioactive isotope of iodine, a relatively new addition to the clinical armamentarium. In previous years, implantations with radon seeds or gold grains had to be specially prepared for each individual patient because of the short half-life of these isotopes. Thus, outside of major cancer centers which used the isotopes frequently, it was not possible to have a supply on hand. ¹²⁵I has a 60 day half-life and a gamma energy of 28 Kev. Because of the longer half-life (60 days, in contrast to 3 days for radon), the seeds can be stored for up to two months without enough loss of activity to prevent their usage. Thus, they are readily available for use on an on-call basis.

In addition, radiation protection for operating personnel, physicians, and nursing staff is much simpler because of the low energy of the iodine isotope. The radiation exposure is further reduced 50% by each adjacent 2 cm. of tissue. Consequently, after the chest is closed, very little radiation is emitted to surrounding tissue.

Therefore when a patient has a small, potentially curable lesion, and can tolerate thoracotomy but not lobectomy or pneumonectomy, interstitial implantation with ¹²⁵I is the alternative treatment. Also, if at exploration there is chest wall invasion, hilar fixation, or intimate adherence of tumor to a major vessel, the surgeon can resect the bulk of the tumor and, at the same time, have the radiation oncologist implant the iodine isotope into the residual tumor. Finally, if the tumor mass is under 8 cm. in diameter but cannot be easily resected, implantation by the radiation oncologist can convert an exploratory thoracotomy into a palliative and possibly curative approach to an unresectable tumor.

Most of the initial work with the iodine isotope in the form of encapsulated metallic seeds was performed by Dr. Basil Hilaris and his associates at the Memorial Sloan-Kettering Cancer Center in New York. They first used the isotope in 1967. Table 1

compares their results to radon seeds and ¹⁹²Iridium.

There is a slightly improved biological effect with Iodine-125 and a reasonably good local control rate. With small localized lesions, the control rate is 75% and with larger regionally invasive lesions, this drops to 50%, with an overall control rate of 67%.

By utilizing this isotope, a much larger dose can be delivered to the tumor with sparing of most of the normal lung tissue and therefore avoiding significant lung injury. In fact, much higher doses can be delivered with this isotope than with the technique of external radiation. With external radiation alone, the tumor dose must be limited to approximately 6000 rads; however, with implant techniques, doses of 14,000 to 18,000 rads are homogeneously delivered to the tumor with sparing of normal tissues due to the rapid decrement in dose outside the implant. The complication rate for implantation (approximately 11%) is the same as that for thoracotomy with lobectomy or pneumonectomy. The radiation oncologist should have prior knowledge of the patient and on call for possible insertion of the radioactive material during surgery.

Finally, this modality can be combined with moderate doses of external radiation. Hopefully, with newer chemotherapeutic approaches and surgical techniques, interstitial implantation will give otherwise "incurable" patients with localized lesions a chance for cure.

Table 1
Local Control vs. Stage and Radionuclide
Patients

	Controlled/Treated ²		
	Stage	²²² Rn	¹⁹² I
I	-/-	4/5	5/6
II	1/2	4/4	2/2
III	18/51	22/51	26/4
TOTAL	19/53	30/60	33/5
Percentage Controlled	36%	50%	63%

^aSTAGE I — A tumor that is 3 cm. or less in greatest diameter without evidence of invasion proximal to a lobar bronchus at bronchoscopy with or without hilar lymph node involvement. Or a tumor greater than 3 cm. in diameter without hilar lymph node involvement.

STAGE II — A tumor greater than 3 cm. in diameter with ipsilateral hilar lymph node involvement.

STAGE III — Any tumor that extends directly into adjacent structures such as chest wall, diaphragm, mediastinum or pericardium. Tumor less than 2 cm. from carina. Tumor associated with atelectasis of entire lung, pleural effusion. Any tumor with mediastinal lymph node involvement.

^bISOTOPES EMPLOYED:

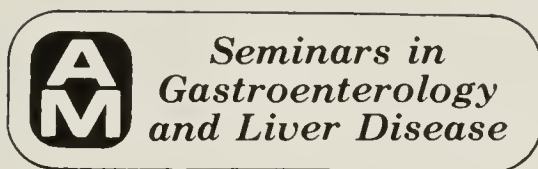
²²²Ra (radon), ¹⁹²Ir (iridium), ¹²⁵I (iodine)

BIBLIOGRAPHY

1. Hilaris, M.D., and Basil, S., Eds.: *Handbook of Interstitial Brachytherapy*, Publishing Sciences Group, Inc., Acton, Mass. 1975.

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*Seminars in
Gastroenterology
and Liver Disease*

Diabetes Mellitus and the Gastrointestinal Tract Part III: Pancreas and Liver

Stephen Glouberman, M.D.

Leon Rigberg, M.D.
Stephen Glouberman, M.D.
George Burdick, M.D., Editors

PANCREAS:

The pancreas is histologically abnormal in up to 2/3 of autopsied diabetics.²³ Fibrosis and hyalinization are the major changes. The majority of the changes occur after age 40, while the peak incidence of death is in the 50s. This suggests that pancreatic changes increase with age, and may be secondary to the disease. Vascular infarcts have been considered to play a role.

One-third of patients with acute pancreatitis develop transient hyperglycemia which remits rapidly, usually within a few days, and rarely lasting up to one or two months.²⁴ Permanent glucose intolerance, however, may occur after a single episode of acute pancreatitis.

Sixty per cent of patients with chronic pancreatitis and pancreatic calcifications have diabetes. Of diabetics without a history of pancreatitis, up to 10% have calcification. The fasting serum insulin levels of patients

with chronic calcific pancreatitis is about half that of normal, or 9 uU./ml.²⁵ The peak insulin output is blunted to one-half or one-third of normal, and has a peak at about two hours rather than at one-half or one hour. If insulin is required for therapy, it is usually at doses of 30-40 units per day or less. These patients may also have low glucagon levels. This, and the insulinopenic response, has been offered as explanations for the low incidence of microangiopathy complicating the diabetes of chronic pancreatitis.

Patients with genetic diabetes who develop pancreatitis have a stormy course with shock and episodes of hypoglycemia supervening. The mortality approaches 90%. Known causes of pancreatitis such as cholelithiasis and alcoholism should be treated prophylactically.

The incidence of malignancy in diabetics is no greater than in the general population. However, pancreatic carcinoma occurs in from 5-19% of diabetics but in only 4% of the general population.²⁶ The reason for this is not clear. Pancreatic cancer rarely destroys the entire pancreas. Obstruction of the pancreatic duct should not be responsible, as insulin is secreted directly into the blood stream, yet the diabetes improves as the

tumor is removed. About 80% of patients with pancreatic carcinoma have their diabetes discovered within two years of the time the cancer becomes manifest, suggesting that the presence of the malignancy causes the diabetes. Many of the rest have had a sudden change in the degree of control in a previously stable diabetic state. A sudden weight loss or an increase in insulin requirement or the onset of insulin requiring diabetes in a middle-aged person should put one on the alert for pancreatic cancer.

LIVER:

The incidence of fatty liver in diabetes ranges from 21-78%.²⁷ There is no correlation between the duration of diabetes and fatty liver or the degree of control and amount of fat in the liver. Sixty-three per cent of diabetics on oral agents have fatty livers, 17% of those on insulin do. There is a distinct correlation between age and obesity with fatty liver. Juvenile diabetics have a less than 5% incidence, while maturity onset patients have the higher rates. Correlation between overweight and fatty liver is about the same in diabetics as in non-diabetics. Loss of weight is usually associated with improvement in the fatty liver, but is usually also associated with improved control. Liver function tests are normal, or only minimally abnormal. The fat is present in large droplets and has the composition of adipose tissue fat, suggesting that enhanced transport from the periphery to the liver is the source of the fat. Increased hepatic lipogenesis may also occur. The fatty liver correlates well with blood triglyceride levels. This condition does not lead to cirrhosis.

Glycogen is found in the nuclei of about 60% of diabetics. Although present in 30% of diabetics without fatty liver, it increases in frequency with increasing amounts of cytoplasmic fat, being present in 100% of patients with massive fatty livers. It is probably produced in the nuclei, and occasionally presents as dense nuclear inclusions. Glycogen nuclei are not specific for diabetes, being seen in Wilson's disease, obesity, tuberculosis and occasionally in hepatitis.

The Australia antigen is present at a greater frequency in diabetics, up to 6.5%.²⁸ The incidence of hepatitis is two to four times greater than in the general population, probably because of repeated hospital exposure.

CIRRHOSIS:

Eighty per cent of cirrhotics have abnormal oral glucose tolerance tests, but only about 20% are frankly diabetic with fasting hyperglycemia and glucosuria.²⁹ Clinically, the presence of ascites and varices correlates significantly with an abnormal GTT, as does a low serum albumin. No other single test of liver function correlates with an abnormal GTT. This implies that the worse the liver disease and the greater the portal hypertension the

more impaired is the carbohydrate tolerance.

The majority of cirrhotics develop impaired glucose tolerance at the time cirrhosis is discovered or thereafter. The disease is usually mild, with diet or oral agents sufficient for control. A family history of diabetes is not common. If diabetes occurs first, the glucose intolerance is greater, often insulin dependent, and a family history of diabetes is the rule.

Fasting serum insulin levels are higher in cirrhotics than controls and the total insulin output after stimulation is greater, but with a delay in the peak levels to one or two hours.²⁷ The highest insulin levels are found in patients with a portacaval anastomosis. This is probably due to blood bypassing the liver, which normally removes up to 50% of the insulin presented to it in a single passage.

The cause of impaired glucose tolerance in cirrhotics is unclear. Insulin resistance may be a factor, but the mechanism is unknown. Elevated plasma nonesterified fatty acid levels, impaired conversion of immunoreactive insulin to biologically active insulin by a diseased liver, absence of a factor necessary for glucose uptake peripherally, and elevated glucagon and growth hormone levels have all been proposed as possible mechanisms.²⁷

Following creation of a portacaval shunt, patients with true diabetes have improved glucose tolerance.²⁹ However, those with an abnormal GTT but without fasting hyperglycemia have further deterioration of glucose tolerance. The mechanism for this remains to be worked out.

Some cirrhotics have low total body potassium levels, despite normal serum potassium.³⁰ They have low fasting and stimulated insulin levels. Replacement of total potassium stores by oral KCl results in normalization of insulin output and return of the GTT to or towards normal. This suggests that potassium may play a role in insulin production or release.

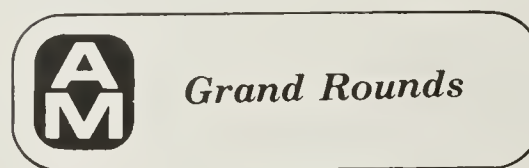
In summary, impaired glucose tolerance in cirrhosis is usually subclinical and may be analogous to the situation in pregnancy, obesity and acromegaly. Peripheral insulin resistance, elevated growth hormone, glucagon and nonesterified fatty acid levels, absence of an hepatic factor, depressed body potassium levels, or a combination may be responsible.

BIBLIOGRAPHY

1. Goyal, R.K., Spiro, H.M.: Gastrointestinal manifestations of diabetes mellitus. *Med Clin N Amer* 55:1031-44, 1971.
2. Carandang, N., Schuman, B.M., Whitehouse, F.W.: The gastric mucosa of patients in diabetic ketoacidosis: A gastrocamera study. *Diab* 17:319, 1968.
3. Knight, A.H., Williams, D.N., Ellis, G., et al: Significance of hyperamylasemia and abdominal pain in diabetic ketoacidosis. *Brit Med J* 3:128-31, 1973.
4. Mandelstam, P., Lieber, A.: Esophageal dysfunction in diabetic neuropathy-gastroenteropathy. *JAMA* 201:582-6, 1967.
5. Mandelstam, P., Siegel, C.I., Lieber, A., et al: The swallowing disorder in patients with diabetic neuropathy-gastroenteropathy. *Gastroent* 56:1-12, 1969.
6. Vela, A.R., Balart, L.A.: Esophageal motor manifestations in diabetes mellitus. *Amer J Surg* 119:21-6, 1970.
7. Roon, A.J., Mason, G.R.: Surgical management of gastroparesis diabeticorum. *Calif Med* 116:58-61, 1972.

8. Dotevall, G.: Gastric emptying in diabetes mellitus. *Acta Med Scand* 170:423-9, 1961.
9. Dotevall, G.: The influence of diabetes on gastric secretion. *The Physiology of Gastric Secretion* 659-663, Universitetsforlaget, Oslo, 1968.
10. Dotevall, G.: Gastric secretion of acid in diabetes mellitus during basal conditions and after maximal histamine stimulation. *Acta Med Scand* 170:59-69, 1961.
11. Konturek, S.J., Urban, A.: The correlation between gastric acid secretion and histology of fundic and antral gland area. *Scand J Gastro* 4:463-8, 1969.
12. Moore, J.M., Neilson, M.E.: Antibodies to gastric mucosa and thyroid in diabetes mellitus. *Lancet* 2:645-7, 1963.
13. Kanaghinis, T., Iatromanolakis, N., Ikkos, D., et al: Intrinsic factor secretion in the gastric juice in diabetes mellitus. *Amer J Dig Dis* 18:85-91, 1973.
14. Arapakis, G., Bock, O.A.A., Williams, D.C., et al: Diabetes mellitus and pernicious anemia. *Brit Med J* 1:159-61, 1963.
15. Chaudhary, M.A., Olsen, W.A.: Jejunal disaccharidase activity in maturity onset diabetes. *Amer J Dig Dis* 18:199-200, 1973.
16. Castiglioni, L.J., Patterson, M.: Diabetic diarrhea. *Texas Med* 65:101-4, 1969.
17. Whalen, G.E., Soergel, K.H., Genee, J.E.: Diabetic diarrhea. *Gastroent* 56:1021-32, 1969.
18. Goldstein, F., Wirts, C.W., Kowlessar, O.D.: Diabetic diarrhea and steatorrhea. *Ann Int Med* 72:215-8, 1970.
19. Mann, J.G., Brown, W.R., Kern, F., Jr.: The subtle and variable clinical expressions of gluten-induced enteropathy (adult celiac disease, nontropical sprue). *Amer J Med* 48:357-66, 1970.

20. Gitelson, S., Oppenheim, D., Schwartz, A.: Size of gallbladder in patients with diabetes mellitus. *Diab* 18:4 1969.
21. Hensley, G.T., Soergel, K.H.: Neuropathologic findings in diabetic diarrhea. *Arch Pathol* 85:587-97, 1968.
22. Angervall, L., Save-Soderbergh, J.: Microangiopathy in digestive tract in subjects with diabetes of early onset and duration. *Diabetologia* 2:117-22, 1966.
23. Null, J., Tillman, R.L., Shelton, A.L., et al: Pancreatic changes in maturity onset diabetes mellitus. *J Nat Med* 65:65-7, 1973.
24. Johansen, K., Ornsholt, J.: Frequency of diabetes acute pancreatitis. *Metab* 21:291-6, 1972.
25. Rogers, J.B., Howard, J.M., Pairent, F.W.: Serum insulin levels in patients with chronic pancreatitis. *Amer J* 119:171-4, 1970.
26. Karmondy, A.J., Kyle, J.: The association between carcinoma of the pancreas and diabetes mellitus. *Brit J Surg* 56:6 1969.
27. Creutzfeldt, W., Frerichs, H., Sickinger, K.: Liver dysfunction and diabetes mellitus. *Prog in Liver Dis* Vol.3:371-407, 1970.
28. Madalinski, K., Bryosko, W.J., Malczewski, B., et al: HAA in sera of diabetic patients. *Lancet* 1:701-2, 1970.
29. Conn, H.O., Schreiber, W., Elkington, S.G.: Associated impaired glucose tolerance with portal-systemic shunt in laennec's cirrhosis. *Amer J Dig Dis* 16:227-39, 1971.
30. Podolsky, S., Zimmerman, H.J., Burrows, B.A., et al: Potassium depletion in hepatic cirrhosis. *NEJM* 288:644-8, 1973.



ANA, DNA, AND SLE

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INTRODUCTION

We will consider the role of DNA in autoimmune diseases and the evidence for genetic and environmental influences upon the induction of autoimmunity and antinuclear antibodies (ANA's). The prototype illness in which an autoimmune reaction to DNA develops is systemic lupus erythematosus (SLE). Native DNA is double-stranded and is not immunogenic under normal circumstances, but denaturation of DNA renders it immunogenic. We will consider conditions which could alter DNA or the body's reactivity to it.

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Role of Viruses

There is some evidence for a role of viruses as an etiologic factor in SLE. Certain New Zealand Black (NZB) mice, especially females, develop an SLE-like illness with renal disease, lymphoma, and circulating antinuclear antibodies. A decade ago a filtrable agent was derived from NZB lymphoma cells and showed C-type particles on electron microscopy.¹ C-type viruses contain reverse transcriptase and their RNA may code for DNA which might be carried along with the genetic material to the next generation. These particles can be found in NZB mouse tissues from embryo through adult.² Viral antigens have been detected in the glomerular lesions of these animals along with immunoglobulin supporting their role in immune complex nephritis.³ More recently a cell free extract from the spleen of a mouse with SLE was injected intraperitoneally into mice and induced an SLE-like illness accompanied by plasmacytoma and antinuclear antibodies in the serum.³ In murine myxovirus-like and paramyxovirus-like particles have been demonstrated in epithelial cells of kidneys and skin and lymphocytes from SLE patients but the tubuloreticular structures are thought to be some not to represent viral material but merely cell damage due to viral infection. Patients with SLE may have high antibody titers to certain viruses including measles, mumps, parainfluenza type I, rubella virus compared with normal individuals.⁵ Furthermore, complement proteins are utilized in clearing viruses from the circulation, and patients with inherent complement deficiencies have manifested lupus-like illnesses.⁶

Diagnosis

There has been a 25-fold increase in frequency of diagnosis of SLE in the past twenty-five years largely due to the increased availability of newer tests particularly the ANA determination by immunofluorescence.⁸ The diagnostic criteria for SLE according to the American Rheumatology Society are:

Association are based on epidemiologic data and 95 percent of patients with SLE have four or more of these criteria (see Table 1).⁷ Illness with a rash or another sign in the list which can be explained by another mechanism exclude these criteria

Table I

ARA Criteria for classification of SLE

1. Facial erythema
2. Discoid lupus
3. Raynaud's phenomenon
4. Alopecia
5. Photosensitivity
6. Oral or nasopharyngeal ulceration
7. Arthritis without deformity
8. LE cells (two or more)
9. Chronic false positive serological tests for syphilis (>6/12)
10. Proteinuria (>3.5 g/day)
11. Cellular casts
12. Pleuritis or pericarditis
13. Psychosis or convulsions
14. Haemolytic anaemia or leucopenia (<4000/mm³) or thrombocytopenia (<100 000/mm³)

from consideration. Although SLE is more common in females, drug-induced lupus erythematosus is more common in males as will be discussed later.

Other connective tissue disorders in which ANA's commonly develop include scleroderma, Sjogren's syndrome, Raynaud's phenomenon, and the so-called "mixed-connective tissue disease syndrome" (MCTD), which will be discussed later.

Cellular Aspects

Lymphocytes from patients with SLE are abnormal. There are: (1) decreased numbers of T cells⁹ (2) decreased numbers of B cells⁹ (3) an increased population of null cells which lack the characteristics of T & B cells⁹ (4) decreased mitogenic response of lymphocytes to agents such as phytohemagglutinin which is primarily a T-cell function.¹⁰ There also appears to be a serum factor from SLE patients which is inhibitory to mitogenic functions of lymphocytes from SLE patients and even inhibits functions of lymphocytes from normal individuals.¹¹ There is increased binding of radiolabelled, double-stranded DNA by lymphocytes from SLE patients¹² and serum from SLE patients, the latter attributed to the presence of anti-DNA antibodies.¹¹ Many serum abnormalities in SLE patients are more marked in patients with active SLE, especially those with severe nephritis.¹³

Antinuclear Antibodies in SLE

Techniques to demonstrate ANA by direct immunofluorescence use substrates of liver, kidney or cells from tissue culture which contain mammalian cell nuclei. Serum to be studied is layered upon a

cryostat tissue section, excess serum rinsed away, and a fluoresceinated anti-human gammaglobulin antiserum prepared in an experimental animal is applied. Specific fluorescence in portions of the nucleus is produced by this sandwich technique.¹⁴ Anti-DNA antibodies which produce a rim or peripheral nuclear staining pattern are often seen in patients with active SLE associated with glomerulonephritis, although certain ill patients have circulating free DNA.¹⁵ If anti-DNA antibody persists in high titer despite treatment, the prognosis is poor and renal function frequently deteriorates in the subsequent months.¹⁶ A radioimmunoassay technique has been developed to determine anti DNA using radiolabelled DNA.¹⁷

A new substrate for immunofluorescence *Crithidia lithidia*, a hemoflagellate which is pathogenic only to the blowfly contains double-stranded mitochondrial DNA without proteins in a kinetoplast. This immunofluorescent assay for antibodies to native DNA is a more direct assay for anti-DNA antibodies than the standard ANA, and is as sensitive but more convenient than the radioimmunoassay.¹⁸

The lupus erythematosus (LE) cell is thought to be a result of antibody to deoxyribonucleoprotein, a DNA-histone complex. This antibody may enter damaged leukocytes resulting in nuclear swelling, after which a phagocytic cell engulfs this damaged nucleus which becomes a hematoxylin body.¹⁹ This antibody also produces the typical diffuse or homogeneous ANA pattern.¹⁴

Drug-induced Lupus Erythematosus

Many drugs (see Table II) have been implicated as activators of a syndrome consisting of symptoms, physical findings, and serologic and biochemical abnormalities similar to those found in SLE. Studies of the pathogenesis and clinical features of

Table II. Some drugs which may induce lupus

1. Anticonvulsants
2. Antibiotics
3. Chlorpromazine
4. Hydralazine
5. Isoniazid (INH)
6. Oral contraceptives
7. Paraminosalicylic acid (PAS)
8. Phenylbutazone
9. Procainamide
10. Quinidine
11. Thiouracils

the drug-induced SLE-like syndrome have yielded information useful in predicting which individuals are at high risk of developing this complication, and this has helped to give us a better understanding of idiopathic SLE.

Procainamide-induced SLE-like syndrome has been best described. Blomgren et al²⁰ described clinical and laboratory features of 44 patients, of whom 26 were

male, who developed symptomatic SLE-like syndrome while receiving conventional doses of procainamide. The most common symptoms (see Table III) including symmetric, polyarticular arthralgias and diffuse proximal and distal myalgias. Pleuritic chest pain, pleural effusions, or pulmonary infiltrates occurred in over one half of the patients.

ANA's were found in 100% of these patients with drug-induced LE, and LE cells in 77%. Other studies have found ANA's in 50 to 75 percent of all patients treated with procainamide; drug-induced LE developed in about 10 percent.^{21,22} These ANA's usually react against either single stranded DNA or nucleoprotein, and in contrast to idiopathic SLE antibody to native DNA and renal impairment are not features of the syndrome. Symptoms resolve within days to weeks after discontinuation of the procainamide but in severe cases prednisone appears to hasten resolution. ANA titers regress over a period of months to years after stopping the procainamide.

Table III. Frequent finds in drug-induced lupus - % incidence

Positive ANA	100%
LE cells	77
Arthralgias	77
Pleuropulmonic involvement	52
Myalgias	48
Fever	45
Weight loss	23
Previous drug reactions	23

Although the pathogenesis of the drug-induced SLE-like syndrome remains unexplained, investigations have demonstrated interactions between hydralazine or procainamide and DNA and other macromolecules.²⁰⁻²³ Hydralazine, for example, can increase the viscosity of DNA and nucleoprotein solutions and prevent proteolytic digestion of the DNA-protein complex, which could then serve as a source of immunogenic material.²³

For the clinician it would be desirable to be able to predict which patients are at greatest risk for developing complications from drug therapy. Hepatic acetyl transferase can acetylate certain drugs, including hydralazine, isoniazid, sulfamethazine and procainamide.²⁴ There is a bimodal distribution of acetyl transferase enzyme activity in this country with approximately half the population phenotypable as slow acetylators and half as fast acetylators. Slow acetylators develop more adverse effects from these drugs.²⁵ Furthermore, among 57 patients on hydralazine there was a strong association between slow acetylation, the presence of antinuclear antibodies, and the development of a clinical lupus-like syndrome.²⁶ In one study of acetylator phenotype in 14 patients with idiopathic SLE, ten were slow acetylators, two fast acetylators and two indeterminate.²⁷ These results raise the possibility that unknown aromatic amine

compounds present in the environment may be metabolized by this enzyme, placing slow acetylators at greater risk of developing autoimmune disorders.

Considering the similarity of metabolism and toxicity of hydralazine and procainamide, a prospective study of 42 patients of long-term procainamide therapy was undertaken.²⁸ Thirty-five of the 42 patients developed a significant ANA titer. Twelve developed a clinical lupus-like syndrome, of which eleven were tested for acetylation phenotype and eight were found to be slow acetylators. Of the twenty-three patients with positive ANA tests but without clinical illness, eight of the nine patients tested for acetylator phenotype were fast acetylators. These data suggest that acetylator phenotyping might be valuable prior to instituting long term procainamide or hydralazine therapy. Careful observation for this syndrome should be undertaken particularly in patients who are slow acetylators.

Other Antinuclear Antibodies

Other ANA's which have been characterized are those which produce speckled and nucleolar patterns by immunofluorescence. Speckled patterns are due to the presence of antibodies to saline-soluble extractable nuclear antigens (ENA) which include acidic nuclear proteins (also known as Sm) or antibodies against nuclear-ribonucleoprotein (RNP).¹¹ Antibodies to Sm are found primarily in patients with SLE, often inactive, whereas antibodies to RNP are found in patients with SLE, Sjogren's syndrome, scleroderma and in patients with mild or overlapping syndromes for which the term "mixed connective tissue disease" (MCTD) was coined.¹¹ The presence of anti-RNP antibodies is not diagnostic for MCTD or any other disease nor are these antibodies protective against renal disease.²⁹ However, when these antibodies are found in the absence of other ANA's such as anti-DNA antibodies, this seems to correlate with the absence of renal involvement even in SLE patients.

Antibodies to mammalian nucleoli have been reported primarily in patients with scleroderma, Sjogren's syndrome, and patients with Raynaud's phenomenon but these antibodies occur only rarely.³⁰

Patterns of diffuse nuclear staining have been produced by sera from patients with rheumatoid arthritis but these antibodies are not usually directed against DNA-containing antigens and may produce confusion interpreting ANA patterns.¹⁴

Summary

In summary, genetic and environmental factors such as chronic viral infections, ultra-violet light exposure and certain drugs may precipitate or aggravate autoimmune disease in certain animals and in certain patients. Patients with autoimmune diseases may develop antinuclear antibodies against DNA and RNA-containing

antigens and nuclear proteins. The rim pattern correlates with active SLE and nephritis whereas the homogeneous pattern in SLE correlates with the presence of LE cell factor and is also observed in drug induced LE. Speckled patterns may be observed in SLE, usually without renal disease and in scleroderma, Sjogren's syndrome and in overlap states in which features of several connective tissue disorders may be present.

BIBLIOGRAPHY

1. Mellors, R.C., and Huang, C.Y., Immunopathology of NZB BL mice, v. viruslike (filtrable) agent separable from lymphoma cells and identifiable by electron microscopy, *J Exp Med* 124:1031, 1966.
2. Block, S.R., and Christian, C.L., Pathogenesis of Systemic Lupus Erythematosus, *Am J Med* 59:149, 1975.
3. Lewis, R.M., Tannenber, W., Smith, C., Schwartz, R.S., C-type viruses in Systemic Lupus Erythematosus, *Nature* 252:78, 1974.
4. Christian, C.C., Systemic Lupus Erythematosus and Type C RNA viruses, *NEJM* 295:501, 1976.
5. Vesikari and Latinen, Antibody levels to multiple diral antigens in Systemic Lupus Erythematosus and some other connective tissue diseases, *Ann Clin Res* 6:207, 1974.
6. Kohler, P., Michael, A.F., and Herdman, R.C., Inherited Complement deficiencies and Systemic Lupus Erythematosus: An immunogenetic puzzle, *Ann Int Med* 82:420, 1975.
7. Lie, T.H. and Rothfield, N.F., An evaluation of the preliminary criteria for the diagnosis of systemic lupus erythematosus, *Arth. & Rheum.* 15:532, 1972.
8. Dubois, E.L., The Clinical Picture of Systemic Lupus Erythematosus, ed. by E.L. Dubois, Univ. of S. Calif. Press 1974, p. 232.
9. Scheinberg, M.A. and Cathcart, E.S., B cell and T cell lymphopenia in Systemic Lupus Erythematosus, *Cellular Immunology* 12:309, 1974.
10. Suci-Foca, N. Buda, J.A., Thiem, T., and Reemtsma, K., Impaired responsiveness of lymphocytes in patients with Systemic Lupus Erythematosus, *Clin Exp Immunol* 18:295, 1974.
11. Horwitz, D.A., and Cousar, J.B., A relationship between impaired cellular immunity, humoral suppression of lymphocyte function and severity of systemic lupus erythematosus, *Am J Med* 58:829, 1975.
12. Bankfurst, A.D., and Williams, R.C., Identification of DNA-binding lymphocytes in patients with systemic lupus erythematosus, *J Clin Invest* 56:1378, 1975.
13. Bardana, E.J., Harbeck, R.J., Hoffman, A.A., Pirofsky, B., and Carr, R.L., The prognostic and therapeutic implications of DNA:Anti-DNA immune complexes in systemic lupus erythematosus, *Am J of Medicine* 59:515, 1975.
14. Tan, E.M., Northway, J.D. and Pinnas, J.L., The Clinical Significance of Antinuclear Antibodies, *Postgrad. Med.* 54:143, 1973.
15. Tan, E.M., Schur, P.H., Carr, R.L., and Kunkel, H.G., Deoxyribonucleic acid (DNA) and antibodies to DNA in the serum of patients with systemic lupus erythematosus, *J Clin Invest* 45, 1732, 1966.
16. Adler, M.D., Baumgarten, A., Hecht, B. and Siegel, N.J., Prognostic significance of DNA-binding capacity patterns in patients with lupus nephritis, *Ann Rheum Dis* 34:344, 1975.
17. Holian, J., Griffiths, I.D., Glass, D.N., Maini, R.N. and Scott, J.T., Human Anti-DNA antibody: reference standards for the diagnosis and management of SLE, *Ann Rheum Dis* 34:738, 1975.
18. Stingl, G., Meingassner, J.G., Swelty, P. and Knapp, W., An immunofluorescent procedure for the demonstration of antibodies to native, Double-stranded DNA and of circulating DNA-anti-DNA complexes, *Clin Immun & Immunopath* 6:131, 1976.
19. Friou, G.J., The LE cell factor and antinuclear antibodies, in *Laboratory Diagnosis Procedures in the Rheumatic Diseases*, ed. by Cohen, A.S., Little, Brown, Boston 1967, p. 114.
20. Blomgren, S.E., Condem, J.J., Vaughan, J.H., Procainamide-induced lupus erythematosus, *Amer J Med* 52:338, 1972.
21. Blomgren, S.E., Condem, J.J., Bignall, M.C., et al., Antinuclear antibody induced by procainamide. A prospective study, *New Eng J Med* 281:64, 1969.
22. Dubois, E.L., Molina, J., Bilitch, M., et al: Procainamide-induced serologic changes in asymptomatic patients. *Arth Rheum* 11:477, 1968.
23. Tan, E.M., Drug-induced autoimmune disease, *Fed Proc* 33:1894, 1974.
24. Reidenberg, M.M., Drayer, D.E., Levy, M., and Warner, H., Polymorphic acetylation of procainamide in man. *Clin Pharmacol Ther* 17:722, 1975.
25. La Du, B.N., Isoniazid and pseudocholinesterase polymorphisms, *Fed Proc* 31:1276, 1972.
26. Perry, H.M., J., Tan, E.M., Carmody, S., Sakamoto, A., Relationship of acetyl transferase activity to antinuclear antibodies and toxic symptoms in hypertensive patients treated with hydralazine, *J Lab Clin Med* 76:144, 1970.
27. Reidenberg, M.M. and Martin, J.H., The acetylator phenotype of patients with systemic lupus erythematosus. *Drug Metab Disposition* 2:71, 1973.
28. Henningsen, N.C., Cederberg, A., Hanson, A., Johnsson, B.W., Effects of long-term treatment with procainamide, *Acta Med Scand* 198:475, 1975.
29. Reichlin, M., Problems in differentiating systemic lupus erythematosus and mixed connective tissue disease, *NEJM* 295:1194, 1976.
30. Pinnas, J.L., Northway, J.D., and Tan, E.M., Antinuclear antibodies in human sera, *J Immunology* 111:996, 1973.



Drug Therapy Problems

ROBERT E. PEARSON, M.S., R.Ph.

Most practitioners rely upon their own reading plus other external sources to assist them in their quest to remain abreast of the biomedical literature. This feature is intended to provide firm information, to answer some questions and to stimulate awareness of the availability of an unbiased source of biomedical information. The format includes: questions and answers, with the questions being provided by readers and/or users of our service; abstracts from the literature; brief descriptions of newly-marketed items; brief discussions of new innovations in therapy; and short exercises regarding specific drug products.

ABSTRACT OF INTEREST: Takesh. A., Nakamura, M. (The Research Institute of Angiocardiology and Cardiovascular Clinic, Kyushu University Medical School, Fukuoka, Japan 812), Tajimi, T., Matsumoto, H., Kuroiwa, A., Tanaka, S., and Kikuchi, Y.: Long-Lasting Effect of Molsydomine on Exercise Performance. *Circulation* 55:401-407, 1977.

Eight male patients ranging in age from 51 to 71 years (mean 60 years) participated in a cross-over study of molsydomine versus placebo (molsydomine is not yet available in the U.S.). The patients had histories of exertional angina pectoris of from 6 months to five years duration. None had a history of myocardial infarction. Patients were drug free except for nitroglycerin during hospitalization for the study. Baseline values were obtained for the exercise stress test on at least two different days. Two hours after oral administration of 2mg molsydomine, the exercise stress test produced results significantly better ($P < 0.05$) than placebo. Onset of angina was 7.3 minutes during exercise after placebo dosing as compared to 7.3 minutes after molsydomine dosing. In these same patients during exercise stress testing within 3 minutes after 0.3mg of nitroglycerin, the onset of angina occurred in 7.9 minutes. The authors feel that molsydomine offers prophylaxis for angina pectoris comparable to nitroglycerin.

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at molsydomine's duration is two hours
er oral administration.

ABSTRACT OF INTEREST: Calimlim, J.
(Department of Pharmacology, Univer-
y of Rochester, School of Medicine, 601
mwood Avenue, Rochester, NY 14642),
ardell, W. M., Davis, H. T., Lasagna, L.,
d Gillies, A. J.: Analgesic Efficacy of an
ally Administered Combination of Penta-
cine and Aspirin, *Clin Pharmacol Ther*
34:43, 1977.

Four regimens of aspirin, pentazocine,
d placebo were evaluated in a randomized,
uble-blind trial. The regimens were: a) 650
g of aspirin (A650); b) placebo (PBO); (c) 25
g of pentazocine plus 325 mg of aspirin
(A-L); and d) 50 mg pentazocine plus 650 mg
aspirin (PA-H). By random assignment,
patients received PBO; 23 received A650;
received PA-L; and 23 received PA-H.
st-op patients requesting an analgesic for
oderate-to-severe pain within the first 3
ys received a single oral dose of the study
ug. A trained observer evaluated pain
ief via patient interview. Interviews were
ade at the time the medication was given
so, at 0.5 hr, 1 hr, and hourly through hour 5
er the medication was given. At each
erview, 4 subjective measures were re-
ded: a) pain score on an ordinal scale
(= no pain to 4 = severe pain), b) pain relief
ative to pain before medication (0 = worse
4 = complete relief), c) pain analog score
(no pain to 100 = worst pain I have ever
perienced) marked on a 20-cm line by the
tient, and d) rating of medication (1 = poor
5 = excellent.) Five derived parameters
re computed from a), b), and c) above for
98 patients, while d) was termed a
"GLOBAL performance" and measured on
patients. The GLOBAL rating was
emed to be the most sensitive. GLOBAL
cores were: 1) PBO, 2.4; b) A650, 3.6; c) PA-L,
; and d) PA-H, 4.5.

ABSTRACT OF INTEREST: Wilson, P.
(Department of Clinical Microbiology, The
ndon Hospital, Whitechapel, London, E1
B), and Ramsden, R. T.: Immediate
ffects of Tobramycin and Correlation with
Serum Tobramycin Levels, *Brit Med J* 1:259-
21, 1977.

Three case reports are presented showing
mediate decreases in cochlear output after
osing with tobramycin. In each case, the
crease was reversible and the patients
re otologically asymptomatic both during
d after treatment. All patients were
ologically normal prior to tobramycin
osing and required the drug for *Ps.aeru-*
nosa (2 cases) or *Ps. aeruginosa* plus
aph. aureus (1 case) infections. The dosing
tobramycin was 120 mg intravenously as
bolus over three minutes, followed by
ng every eight hours. Cochlear output was
asured by transtympanic electrocochleo-
aphy. The decrease in cochlear output was
% below baseline at 85 minutes post-
ection in Case 1 (serum tobramycin 11.2
g/ml at peak, approx. 7 mcg/ml at 85
minutes), 35% below baseline at 85 minutes

post-injection in Case 2 (serum tobramycin
15.6 mcg/ml at peak, approx. 7 mcg/ml at 85
minutes); and 25% below baseline at 55
minutes post-injection in Case 3 (serum
tobramycin 7.4 mcg/ml at peak, approx.
5 mcg/ml at 55 minutes). Onset of decreased
cochlear output occurred immediately after
cessation of injection. Mid-treatment electro-
cochleography also showed tobramycin-
related disturbances.

ABSTRACT OF INTEREST: Malone, A.
J., Field, S., Rosman, F., And Shemerdiak, W.
P. (West Side Veterans Administration Hos-
pital, Chicago, IL 60612): Neurotoxic Reac-
tion to Oxacillin, *N Eng J Med* 296:453, 1977.

A 37-year-old heroin addict was admitted
with a diagnosis of acute bacterial endo-

carditis. The organism involved was *Staph.*
aureus, sensitive to oxacillin. Patient re-
ceived oxacillin at a dose of 12 g/day for 8
weeks. During this time, renal function
deteriorated (CrCl=17 ml/min). Within six
hours of stopping oxacillin, the patient's
temperature rose to 39.4 C. Oxacillin was
restarted at a 16 g/day dose level. Two days
later, two grand mal seizures occurred, with
residual, bilateral ankle clonus. At this time,
BUN was 56 mg/dl and creatinine was
3.9 mg/dl. CSF levels of oxacillin after the
second seizure were 70 mcg/ml. Oxacillin
was discontinued and blood levels 48 hours
later were 6 mcg/ml. The authors caution
against high doses of oxacillin in patients
with compromised renal function.



Radiology Case of the Month

CASE #21

JOHN C. BJELLAND, M.D.
JOHN C. BUSH, M.D.



Figure 1. Neutral posteroanterior projection
of the right wrist.



Figure 2. Lateral projection of the right
wrist.

The patient is an elderly female who had
injured her right wrist. The radiographs
obtained (Figs. 1. and 2.) demonstrate:

1. soft tissue swelling of the wrist
2. generalized osteopenia,
3. a healing, non-pathologic, Smith's
or reversed Colles' fracture,
4. an ulnar styloid process avulsion
fracture,

and 5. the diagnosis of interest—what is it?
Be specific.

From: Arizona Health Sciences Center, Dept. of Radi-
ology, Tucson, AZ 85724.

Secondary Rotational Subluxation of the Carpal Navicular

Associated with a Smith's Type Fracture



Figure 3. Same radiograph as Figure 1 except for the circumscribed and triangulated highlights which demonstrate two Major Diagnostic signs (see text for explanation).



Figure 4. Comparison radiograph of a normal right carpus.

Rotational subluxation of the carpal navicular, or scaphoid bone, is a subtle, frequently overlooked abnormality which can result in serious clinical consequences. When unattended, severe progressive osteoarthritic changes can develop, that may necessitate proximal carpal row excision and radiocapitate arthrodesis.

This presentation will briefly review the (1) diagnostic roentgen signs, (2) anatomy of dislocation, (3) physical findings, and (4) differential diagnosis for this condition.

I. ROENTGEN SIGNS

The four (4) cardinal signs specific for this diagnosis are:

1. **Two Major Signs:** See Fig. 3. and compare with Fig. 4.

A. **The TRIANGULAR LUCENCY SIGN**, *i.e.*, a widening of the naviculolunate joint, which is dependent on the degree of concurrent naviculolunate dissociation.

B. **The NAVICULAR CORTICAL "RING" SIGN**,* *i.e.*, a circular cortical density noted within the distal navicular outline.

2. **Two Minor Signs:**

A. **The NAVICULAR "FORESHORTENING" SIGN**, *i.e.*, the subluxed navicular has an apparent roentgen reduction of its longitudinal dimension, when compared with the normal contralateral navicular. This is observed only on neutral PA views and is due to the accentuated volar angulation the subluxed navicular assumes in its new orientation (see Fig. 3., compare with Fig. 4.).

B. **The DECREASED RADIO-NAVICULAR ANGLE SIGN**, *i.e.*, a more "upright" orientation of the navicular than is normal, notable *ONLY* on the lateral view (see Fig. 2.).

In any given case, not all roentgen signs will necessarily be present. Their presence or absence is a function of the degree of abnormal navicular rotation that occurred with subluxation. Statistically, the two major signs outlined have greater diagnostic import and are more easily appreciated by the casual observer. The two minor signs are "soft" signs more difficult to identify. Since three of the four roentgen signs are noted only on the neutral PA view, it is the radiograph of diagnostic choice for best evaluation of the condition.

II. ANATOMY

To account for the roentgen findings, a torque of the navicular must occur along its long axis (which is in the anatomic trans-

verse plane). This results in the distal pole of the bone (*i.e.*, the intermediate waist and distal tubercle) angulating in the volar direction. Simultaneously, the proximal pole of the navicular (*i.e.*, the body and its radiocarpal surface) rotates posteriorly, subluxing toward the dorsum of the wrist.

III. PHYSICAL FINDINGS

The clinical presentation includes the following symptoms and signs: (1) pain; (2) limitation of extension, supination, and pronation; (3) point tenderness and swelling over the radionavicular joint localized by finger tip palpation; and occasionally, appreciation of a palpable click over the radionavicular joint during extension. These findings relate to encroachment of the distal radius on the proximal pole of the subluxed navicular.

IV. DIFFERENTIAL DIAGNOSIS

The diagnostic gamut for this entity is limited. It may be considered either a primary or secondary condition. Secondary subluxation is *ALWAYS* the result of significant trauma. This occurs either as an isolated phenomenon, or, more frequently, (2) in conjunction with other carpal dislocations (especially lunate and pisiform) and/or fractures (as in this case with an associated Smith's fracture and ulnar styloid avulsion). Contrarily, primary subluxation of the navicular may be considered to bear *NO* relationship to trauma. This may be either (1) *idiopathic* or (2) *pathologic* in origin. The latter is due to an intrinsic disease process which has effected sufficient ligamentous laxity or destruction to facilitate the subluxation during normal daily activity (*e.g.*, as often occurs in rheumatoid arthritis, etc.).

To summarize, rotational subluxation of the carpal navicular has somewhat subtle but characteristic roentgen findings. If the condition is allowed to persist, considerable disability may result. The specific roentgen signs discussed must be recognized to enable successful orthopaedic treatment.

Acknowledgement

We are gratefully indebted to Drs. Harold Willingham, Orthopedist, and Andre J. Bruwer of Radiology, L'Oratoire, Tucson, Arizona, for their contribution and assistance in preparation of this case.

Considered *PATHOGNOMONIC* when present, the sign is only occasionally demonstrated. It is due to the shadow cast by the tubular cortex of the navicular waist, which must be aligned in an exact plane to effect this "ring" format.

BIBLIOGRAPHY

1. Crittenden, J.J., Jones, D.M., and Santanelli, G. Bilateral Rotational Dislocation of the Carpal Navicular. *Radiology* 94:629-630, March 1970.
2. Thompson, T.C., Campbell, R.D., Jr., and Arnold, D. Primary and Secondary Dislocation of the Scaphoid. *Journal of Bone and Joint Surgery* 46-B:73-82, February 1964.



VD Control

Controlling?

An Annual VD Review 1976 — Maricopa County

C. Pinto, M.D., M.P.H.

Editors Note: This decisive discourse on the incidence of venereal disease in central Arizona after a recent explosion, is said again to be on the wane. Dr. John Mahoney USPHS pioneered the use of sulfa drugs in treatment of gonorrhea and penicillin in the treatment of syphilis. His greatest hope and expectation (1945) was that with a specific therapy for gonorrhea and syphilis, along with case finding, his expectation was that these diseases could be eradicated. Dr. Thomas Parran, Surgeon General USPHS had in 1934 made syphilis a household word used in newsprint or radio. In spite of specific therapy a change in sexual mores, has again made these household words, yea household diseases!

Perhaps! At least there has been a dramatic drop in the national rate of increase for gonorrhea from 10% to less than one-half of 1%. Just as encouraging is the report of a decline by 7.4% for infectious syphilis.

Just maybe the federal commitment of increased support to local health departments during the past few years and increased control efforts by local VD centers are finally starting to decrease that VD reservoir!

VD Control reports a tremendous drop of 10% in acute gonorrhea cases which far exceeds the national trend but still representing a community gonorrhea rampage, and a decrease in total number of syphilis cases by 30%. However, the number of infectious syphilis cases still remains stable at about 69 cases.

The main reason for the continuing gonorrhea rampage remains social, but there is a medical component which must be readily identified: 1) use of inappropriate drugs (repository type penicillins have no place in the treatment of gonorrhea and may

well encourage resistance because of its long tail-off and prolonged low serum level of penicillemia), 2) failure to perform test of cures to determine the effectiveness of treatment schedules, 3) failure to recognize and adopt special regimens in pregnant women, gays and prostitutes, 4) failure to vigorously seek out and examine and treat all sexual contacts to active VD, and 5) failure to do a serology on all cases of gonorrhea or other sexually transmitted diseases.

With respect to gonorrhea, there is no doubt that the social aspect is the main culprit. A relatively short incubation period coupled with promiscuity in premarital and extramarital sexual relationships, sex cults, sex orgies, gay bath houses, prostitution and a cavalier attitude ("one shot cures") towards gonorrhea creates almost insurmountable epidemiological control problems. One of the worst offenses is when the patient names many contacts, all of whom are negative, and then finally confesses to one more (who is infected) whom he did not name since he thought she was "pure and clean." Unless all contacts are investigated, the chain of infection cannot be broken. The relatively long incubation period of syphilis permits some latitude in the epidemiological process.

A comparative three-year statistical study reveals that Maricopa County may harbor at least 20% of sexually active males who may be asymptomatic; that is, those male contacts without objective or subjective urethral symptoms and who are at least five or more days past exposure and positive only on culture.

It appears that the percentage of women surprised to learn they have active gonorrheal disease is stabilizing at about 9-10%. This is that group of sexually active women who from curiosity or, as they put it, *just want to be sure* (JWTBS or JiWiTBis - acronym) are chagrined to learn they are infected. Three were amazed to learn they had oral (pharyngeal) gonorrhea. All oral GC's are confirmed by sugar fermentation.

women during routine pelvic examinations. Both public and private clinics throughout the county, other than VD clinics, are cooperating. There is no charge to the patient. All lab work is performed by VD Control, and of 164,473 cultures performed in the past three years, 3,337 were found to be positive. (Table 1.)

Table 1.
Female Gonorrhea Screening
(1974 - 1975 - 1976)

	Cultures #Positive	
Public Type Patients		
MCDHS non VD Clinics	75,940	1,775
ASU Student Health	4,180	185
Terros	2,268	246
CODAC	550	29
Juvenile Detention	2,860	218
Private Type Patients		
Private Physicians	46,057	513
Planned Parenthood	31,544	324
3 Year Total Cultures		
Public Patients	86,872	2,502
Private Patients	77,601	837
GRAND TOTAL	164,473	3,339

More than 50% of women who have been named as a contact, or who have been told their sex partners have gonorrhea, or suspect their sex partners have gonorrhea, do have active disease. Five were surprised to learn they also had oral gonorrhea.

It is interesting to note that the percentage of male urethral exudates that may be classed as *non-gonococcal urethritis* (NGU); that is, fails to smear out any gram negative intracellular diplococci, have now increased to more than 59%. We have joined England where "the number of male NGU's are greater than the number of male G.C.'s." This emphasizes the need to do at least a gram stain for accurate diagnosis. (Table 2.)

A sometimes troublesome but minor complication of adequately treated acute

Table 2.
Male Urethral Exudates

	Number Examined	Number NGU	Percent NGU	Number G.C.	Percent G.C.
1976	7,481	4,452	59	3,029	41
1975	5,975	2,878	48	3,097	52
1974	5,416	2,624	48	2,792	52

In comparison to the 9-10% positive G.C. JWTBS women who reported directly to VD Control and perhaps suspected some type of infection, only 2-3% of the general female population was found to be positive. This appears to compare with the 1-2% JWTBS males.

This interesting statistic was obtained from our ongoing Female Gonorrhea Screening Program, which has been conducted since 1974. The program consists of obtaining a cervical culture on all consenting

gonorrheal urethritis is *post-gonococcal urethritis* (PGU). It appears to be on the increase and presents as a persistent urethral exudate with a negative test of cure (TOC) and readily responds to a total dose of 8.5 gms of Tetracycline. It now represents about 10% of those adequately treated for G.C.

A Test of Cure (TOC) is the best monitor of gonorrhea treatment effectiveness and must be included in any treatment regimen. About 50% of clinic treated cases return for TOC's

with a negligible 1% failure rate. All treatment schedules have been in accordance with recommendations by Center for Disease Control, Atlanta, Georgia. Copies will be forwarded upon request by phoning **VD Control**, Phoenix - 267-0568.

One interesting problem has been: How to manage a patient with a urethral exudate which, when subjected to a gram stain, reveals gram negative *extracellular diplococci* alone or amid other gram positive rods or cocci. At the VD Control Center each such case is cultured but treated as a *non-gonococcal urethritis* (NGU). If the culture is positive for gonorrhea, the patient is then interviewed for contacts and TOC's performed. Of 147 such smears, 34, or 23%, cultured out positive for gonorrhea. The reason for treating such cases as NGU's instead of G.C.'s is that *penicillin* usually has no effect on NGU, whereas *tetracycline* is effective in either.

About 20% of gays reporting for examination are found to have positive gonorrhea

anal cultures. Coincidentally, about 20% of those with the positive anal cultures also have positive oral cultures.

We now have VD on the run—let us not make the same mistakes of the 50's and 60's of depending only upon the "wonder drugs" and treating *only* the symptomatic patients seeking care—the asymptomatic pool is deep. Let us aggressively maintain "hot pursuit" on each case, insisting on examining or referring for examination each and every contact regardless of how "pure". Of course, confidentiality must be maintained and tact is paramount.

Effective VD control dictates a partnership between VD control centers, private physicians and patients with one maxim—*no treatment without diagnosis*. Prophylactic treatment or treatment of a case without epidemiologic follow-up (contacts) carries with it *the grave risk of infective contacts remaining undiscovered and untreated*.

Public education and understanding of

VD Control's major thrusts of screening procedures for asymptomatic disease a patient interview for contact confirmation with aggressive follow-up on all contacts most important for the interruption in the chain of infection in the community a vital to our efforts to keep the VD incidence on the downgrade.

Every patient treated or examined for VD should be advised and afforded the opportunity to advise their contacts to seek medical evaluation and treatment.

VD Control is located at 902 N. 24th Street, Phoenix, Arizona 85004, telephone 267-0568. Clinic hours are from 8:00 a.m. to 5:00 p.m., Monday through Friday, and evening clinic hours are 5:00 p.m. to 7:00 p.m. each Monday, Wednesday and Friday. Darkfield's, serologies, smears and cultures are available at no charge. Our experienced "Communicable Disease Interviewers" (CDI's) are also available for your contact follow-up.

American Indian School of Medicine

Jasper L. McPhail, M.D.

Editors Note: We have asked Dr. McPhail, Vice President and Dean of the American Indian School of Medicine to summarize the present state of development of the school.

The health status of Indians and other Native Americans is considerably below that of the national norm. Similarly the number of health professionals per 100,000 population from among the ranks of these First Americans is the lowest of any identified ethnic group in the country. There is likely a direct relationship between these two facts.

Of 72 self-identified American Indian physicians, only one has ever returned to his home reservation area for his professional career. Attempts to increase the number of Indian physicians by providing scholarships to existing medical schools has proved to be an "insular brain drain" of talented young Indians as they are "scholarshipped out" to serve the general society. Their loss affects more than just the health status of their communities. They represent a greater loss as the necessary role models for Indian youth who by associations hopefully could see themselves as health professionals and as motivators of their communities to seek a health status within the range of that enjoyed by other Americans.

Dr. Taylor McKenzie, the first Navajo medical graduate, had a strong commitment to return to his people and do something about improving their health. After graduating Baylor University College of Medicine in 1958, he specialized in surgery before returning to the Navajo Reservation for all of his career. In 1976, on interviewing nine Navajos currently enrolled in medical schools, it was discovered that every one of them had been influenced to enter the medical profession because of the role model provided by Dr. McKenzie. One student remarked, "All of my life I have seen Anglo physicians—and good ones—but it never crossed my mind that a little Indian boy could become a physician until I saw Dr. McKenzie."

By the late 1960's, Indian groups had begun to talk in terms of developing Health Professions Education Programs specifically designed to prepare Indian health professionals in adequate numbers to deliver quality health care to every Native American.

In 1972, the President of the United States sent out a Task Force headed by Secretary of DHEW, Elliot Richardson, to the area to review the health status of American Indians and to evaluate the feasibility of establishing an American Indian School of Medicine. This task force of eminent Americans reported to the President that not only is an American Indian School of Medicine feasible, it is badly needed as a vital force in improving the health status of all Native Americans.

The same year the Congress passed the Self-Determination and Education Assistance Act which authorized the establishment of appropriate educational programs to prepare adequate manpower so that Indian groups can become self-reliant and

can take the leadership in decisions affecting the destiny of Indians.

In 1972, after realizing that very little would ever be accomplished unless some Indian group took a leadership role and committed itself to specific objectives, the Navajo Tribal Council established the Navajo Health Authority with two major objectives: the first objective is to establish an organization for health in the Navajo Nation similar to a State Department of Health. The second objective is to establish Health Professions Education Programs including a School of Medicine which will prepare Indian and other Americans to provide health care to rural and reservation America.

In view of this second objective, particularly the Navajo Tribal Council appointed a 24-person Board of Commissioners to oversee the Navajo Health Authority. In addition to representatives from a cross section of Navajo Reservation interests, the 24 appointees included:

1. Dr. John Schaeffer, President of the University of Arizona.
2. Mr. Lester Gorsline, distinguished medical school facilities planner.
3. Dr. Robert Bucher, then Deputy Director of the Bureau of Health Manpower, former Dean of Temple University School of Medicine and later founding Dean of the Medical College of South Alabama.
4. Dr. William Knisely, then Vice Chancellor for Health Sciences of the University of Texas and now President of the Medical University of South Carolina.
5. Dr. George Bluespruce, the first Indian dentist and Chairman of DHEW's Intergovernmental Agency Committee on Indian programs from the Pueblo Tribe.
6. Ms. Pauline Tyndall, a registered nurse and nutritionist from the Omaha Tribe.
7. Dr. Irwin Hendryson, orthopedist and

sociate Dean of the University of New Mexico School of Medicine.

Dr. William Darby, physician and chemist on the faculty of Vanderbilt University and President of the Nutrition Foundation.

Ms. Louise Hubbard, a registered nurse and Assistant Director of Nurses at the Ft. Hance IHS Hospital, from the Navajo Reservation.

Dr. Annie Wauneka, daughter of the late Navajo Chief Chee Dodge, Tribal Council member, and for over 50 years spokeswoman for health for her people, and recently featured by *Ladies Home Journal* and Mrs. Betty Ford among the Ten Outstanding Women of America.

Dr. Marlene Haffner, Medical Director of the Navajo Area of the IHS.

Irwin Jarrett, D.B.A. and C.P.A. who is Associate Dean for Planning of Southern Illinois University School of Medicine.

In 1974, Dr. Taylor McKenzie was named to the Board of Commissioners as the Executive Director of the Navajo Health Authority and Executive Dean of the American Indian School of Medicine. He appointed a Medical School Planning Committee chaired by Dr. William Sodeman, formerly Dean of Jefferson College of Medicine, a distinguished medical educator for twelve years on the Liaison Committee for Medical Education. In addition to the medical educators on the Board of Commissioners, Dr. McKenzie appointed representatives from the faculties of the medical schools in the Four Corner States and Dr. James Hampton from the University of Oklahoma Health Sciences Center. Dr. Hampton, an Indian hematologist, is Director of a research institute at the University.

In 1973 and 1975, the Liaison Committee for Medical Education sent staff on site visits to discuss the American Indian School of Medicine with its planners. It was recognized as a "developing" school of medicine. The L.C.M.E. is recognized by the Office of Education as the official accrediting agency for all medical schools in the United States.

During 1975, many possible options for establishing the AISOM were discussed. One of the first concepts discussed was that of setting a quota of Indian students in the medical schools in the Four Corner States or of setting the AISOM as a branch adjacent to one of the established schools. The consensus, even among planners from the Four Corner State schools, was that the AISOM needed its own distinct mission which could not later be merged within another school and that the established schools all existed in areas that were of marginal size to have the necessary financial, physical and human resources to support one school well. On this basis it was decided not to put the school in Albuquerque or Tucson.

Conversations with several institutions of higher learning in the area were held. Formal proposals from Colorado State University and Northern Arizona University to have the

AISOM affiliated were evaluated. The demographic distribution of the American Indian population was studied. The L.C.M.E. requires that a school of medicine be affiliated with an accredited university and that the junior year clerkships be held in hospitals with accredited Graduate Medical Education Programs (residencies) in internal medicine, pediatrics, psychiatry, surgery, family and community medicine and obstetrics-gynecology. Outside the cities which already had one medical school, these conditions could be met only in Phoenix. Phoenix is the largest metropolitan area in America without one or two medical schools already. It has ample human and physical resources for two schools of medicine.

June 22, 1975, the Board of Commissioners voted to begin negotiations with the Board of Regents of Arizona and with appropriate health care facilities to meet accreditation standards. I was appointed as the academic officer to come aboard full-time to proceed with these negotiations. December 20, 1975 the Board of Regents of Arizona voted to approve an academic affiliation between Northern Arizona University and the AISOM.

The basic philosophy of the AISOM is to develop a consortium of institutions of higher learning and health care so that the best of all can be brought together in an Academic Medical Center second to none in the country. Affiliation negotiations to accomplish this are either now in progress or being planned. The long-range objective is to have a Health Sciences University with colleges of medicine, dentistry, health related professions and nursing. Within a consortium arrangements, programs in nursing at Northern Arizona University, ASU and U of A may already have the capabilities of preparing the categories of nurses needed. The approach then may not call for a new school of nursing but for developing a close relationship with programs in existence. The same principle applies to the health-related professions. I do feel strongly that these programs need to be pulled together in colleges of health-related professions rather than being scattered in general colleges at all three of the universities in Arizona. The U of A is moving in this direction now and is to be commended for doing so.

In 1976, legislation for chartering and funding the AISOM was developed. In the House of Representatives of the U.S. Congress, this legislation was incorporated as Title VI of the Jackson-Fannin bill, the Indian Health Care Improvement Act. The proposal passed the Indian and Insular Affairs Committee and the Ways and Means Committee only to be reduced by the Interstate and Foreign Commerce Committee to a Feasibility Study.

The Feasibility Study which will evaluate the need for and site locations for the American Indian School of Medicine is now in progress under the guidance of a National Advisory Group appointed by the Secretary of the Department of Health, Education and Welfare. The findings of this study are to be reported to the Secretary by August 15, 1977 and to the

Congress and the President by September 30, 1977.

It is expected that this Feasibility Study will produce a positive report, as did the original feasibility study by the President of the United States in 1972. If that occurs, funding is expected to come from the next Congress. Other sources of funding are being developed from Indian Tribal groups and private sources. No funds will be sought from the State of Arizona's educational budget since the AISOM is a school of national scope and since there is no desire to compete with the three Universities in Arizona.

The plan for the Academic Medical Center in Phoenix is as follows:

1. The public hospitals will be invited to form the nucleus of integrated teaching hospitals.
2. The private hospitals will be invited to affiliate on mutually agreeable terms on a service-by-service or preceptorship basis.
3. Full-time staff at the public hospitals will be appointed to the faculty on the basis of their credentials and experience in education.
4. Many of the outstanding physicians in the Valley will be invited to join the faculty.
5. Graduate Medical Education Programs in the Valley will not be duplicated but will be invited to affiliate with the medical school in a mutually beneficial arrangement for both.
6. Continuing Medical Education will be planned specifically to meet the needs of the physicians of the area and those practicing on Indian Reservations.

Area Health Education Centers will be developed in rural and reservation locations to provide appropriate settings for education in primary care and family and community medicine. These centers will be on the Navajo Reservation, at the Prescott VA Hospital, and hopefully in Alaska and Oklahoma IHS facilities. Students will spend summer electives and their entire fourth year in these centers.

The student body will be integrated. First preference for admission will be given to American Indians who meet national academic standards for medical school admission. Second preference for admission will be given to other American citizens who are interested in and have a strong commitment to family and community medicine in rural and reservation America.

In 1975, over 500 American Indians took the Medical College Admission Test. Of these, 141 scored within the range that is compatible with success in the medical curriculum. Only 70 were admitted to medical schools because of competition of qualified applicants to medical schools in the U.S.A.; therefore, another 71 potential American Indian physicians were turned away. This means that there is already an adequate pool of students which can be significantly increased within the next few years.

Of the medical students classified as "minority students", American Indians have the lowest attrition rate for academic reasons of any.

Faculty for the school will be recruited nationally. There should be no problem

recruiting for faculty to move to Arizona or to teach in such a unique and innovative curriculum. The quality of applicants to the Indian Health Service and to the Veterans Administration has become very satisfactory for developing academic programs in these facilities.

Admission of the first class at the earliest will be 1979. About 32 to 40 students will be admitted. The size of the entering class will be doubled in 2 to 4 years.

During this phase of planning, I am based at the Phoenix Veterans Hospital where I serve as Director of the Phoenix Integrated Surgical Residency. I also serve as a thoracic and cardiovascular consultant to the Phoenix Indian Medical Center.

obstetrics and gynecology. Sonography is ideal for evaluation of the pregnant uterus. The uterus is filled with amniotic fluid and there is a strong interface between the fluid and the ento-uterine structures, i.e. the placenta and fetus. An interuterine pregnancy can be detected as early as five weeks, and its growth and development can be followed and its eventual total maturity calculated. Some fetal abnormalities, multiple pregnancies, or by hydatiform moles may be diagnosed, and aminocetesis is facilitated.

Neuro-Surgery

"The open microsurgical transphenoidal technique is currently the procedure of choice for performing hypophysectomy. It can be performed in about two hours with low morbidity and mortality and with assurance of a complete hypophysectomy in most cases. With this technique available for hypophysectomy *it is difficult to understand why bilateral adrenalectomy continues to be used as a palliative endocrine-ablation procedure in patients with breast and prostate cancer.* (There are some surgical agnostics who wonder about either procedure.)

Perusal of these concise reviews will enable you to better direct your patient towards the proper surgical therapy.

Medical Mycology

Medical Mycology, Chester W. Emmons, Ph.D., C. H. Binford, M.D., John P. Utz, M.D., and K. J. Kwon-Chung, Ph.D., third edition, Lea & Febiger, Philadelphia 592 pages, 1977.

For a non-mycologist to review this classic is little short of heresy. Each subject is treated with a soul of brevity and yet with a wealth of detailed facts.

For those of us who emerged from the medical citadels well before the B & T cells were tagged for cellular mediated immunity, we are usually overwhelmed by the new nomenclature. Now just consider this as an example of clarity and brevity and this is how Emmons et al., described the functions of T cells. "They have clearly at least five major functions: (1) Delayed cutaneous hypersensitivity (e.g., to tuberculin, histoplasmin, and coccidioidin), (2) Defense against fungal (and viral pathogens), (3) Allograft rejection, (4) graft versus host reactions and, (5) Tumor surveillance".

Each fungal disease is treated under the heading of definition, etiology, historical review, clinical types, differential clinical diagnosis, prognosis and therapy, pathology and laboratory diagnosis.

To the practicing physician and mycologists alike this is the ultimate in source books. **J. W. K.**



Abstracts

Life Saving Gastrotomy

in Acute Drug Intoxication

Prepared by

R. L. Gorrell, M.D.

If a person ingests rapidly a large amount of aspirin, meprobamate, barbiturate, glutethimide (Doriden®), concretions may develop. These concretions are not removed by gastric juices or gastric emptying. To save the patient's life, the stomach should be opened and all the insoluble material removed. If this is not carried out, a slow continuous absorption of the drug occurs and death follows.

1. Goodman, L.S. and Gillman, A.G.: *Pharmacological Basis of Therapeutics*, NYC: MacMillan Co., 1975, page 133.
2. Oderda, G.M.: *Clinical Toxicology*, *J Am Pharm Assoc* NS14:626-640 (Nov.) 1974.

1. Whole tablets of glutethimide have been recovered, surgically, from the stomach of an acutely intoxicated patient days after the ingestion.

2. These concretions may develop if a large amount of the compound has been ingested, over a short period of time. Examples of drugs whose ingestion has caused concretions include meprobamate, aspirin, barbiturates and glutethimide.

Phantom Limb Pain

The sudden sharp pains of phantom limb phenomenon may often be relieved with carbamazepine (Tegretol, Geigy) 400 to 600 mg. daily for four to six months, just as it relieves the pain of tic douloureux. In both instances, the blood count should be taken twice monthly to detect the development of anemia. The dosage can be lowered and, in some instances, entirely eliminated.

Elliott, Frederick: *NEJM* 295:678 (Sept. 16) 1976.

NEWS ITEM

At the recent meeting of the Medical History Club of Arizona, Dr. William Weese was elected President for 1977, succeeding Dr. Clifford Ernst. The club meets three to four times annually to hear a formal presentation relevant to one of the many aspects of medical history. The next meeting will be Tuesday, May 31, 1977, at the home of Dr. and Mrs. Lewis B. Claypool. Interested persons should contact Dr. Weese at 264-5685 for further details.



Book Review

What's New In Surgery?

The January bulletin of the American College of Surgeons goes the gamut of surgical practice and summarizes some of the newest and preferred surgical procedures.

This concise compendium is especially valuable to those of us who are not surgeons by training or choice, and the following excerpts are intended to entice you to spend an evening with this bulletin.

Esophageal Strictures

"At this time then the procedure of choice for esophageal strictures is unresolved. It should again be emphasized that if there are any symptoms or signs of esophagitis, nasogastric tubes should be avoided as these patients are very prone to stricture development. Rather, a decompressing or feeding gastrotomy should be done."

Mallory-Weiss Lesions

"It has been learned during the past year that these lesions are not only frequently multiple but they are frequently associated with mucosal erosions in the esophagus, stomach, and duodenum. About 6% of upper gastrointestinal hemorrhages are due to these lesions."

Liver

"It appears that steroid administration can result in hyperplasia, benign adenoma, and carcinoma of the liver. The most common source of course is oral contraceptives and it is not yet clear what happens when these are discontinued. Clinically these patients present with a liver mass or with massive, sudden intra-abdominal hemorrhage secondary to rupture of these lesions. This new source of intraperitoneal hemorrhage must be kept in mind in the future."

Gynecology & Obstetrics

"Diagnostic ultra sound is being increasingly applied as a clinical tool in



Letters to Editor

Gentlemen:

I would like to express my appreciation for your sponsorship of this year's practice management workshop. The presentation was first class, and I feel the information will be most useful to me as I visit various practice opportunities in this State and others.

I am recommending that all our senior residents in Family Practice here at the University attend your course next year.

Sincerely,

London Moody, M.D.

President, Family Practice

University of Arizona Medical Center

Editor:

The Arizona Department of Health Services, Licensing Section, now has available to the public, a new pamphlet titled "How to Choose a Day Care Center".

This pamphlet is designed to help the parent in choosing the day care center which best meets both parents and child's needs by using a handy checklist of areas to investigate a number of day care centers, and providing information about children's specific age needs and appropriate activities to meet these needs.

If you would like a supply of these or know some agency or group in your community that would be able to use them, they are available free of charge from the Arizona Department of Health Services, Licensing Section, 1740 West Adams, Phoenix, Arizona 85007.

Sincerely,

James R. Chambers, Manager

Licensing Section



Auxiliary Highlights

Jean (Mrs. M. W.) Phillips

Incorporation of the Arizona Medical Auxiliary was a significant announcement at the February state board meeting held at the ARMA building. Efforts toward incorporation have spanned several years of supportive consideration and council between ARMA and the Auxiliary which now so qualifies for favorable IRS status. The location and Charitable 501-3C IRS status



Editorial

Advances in the Office Management of Asthma

The University of Arizona, College of Medicine, traveling faculty came to town and presented a review of the subject.

This was presented January 29, in Tucson and the next day, after an overnight bus trip, this was repeated again in Phoenix at the Veterans Administration Hospital.

To those of you who have not attended one of these "continuing education circuses," sponsored by the medical faculty, the advice is, there is no better way to go.

The lecturers in the morning session kept to schedule. They may have been slightly esoteric but so be it; that's where the practical portions of medicine arise in the first place and they reviewed the present status of the physiology and pharmacology as it relates to practical asthmatic therapy.

Ample time was given for roundtable question and answer sessions in the afternoon. The group was split into small conference style sessions where individual attention could be given to questions on diagnosis and therapy raised by the conference attendees in an informal way.

So the next time the medical school faculty sallies forth to present a review symposium, carefully consider giving them a listen! Chances are you will be pleased with the presentation. J. W. K.

requirements will be added to the Bylaws along with Incorporation data at the state convention. Auxiliaries will need to remain mindful of the requirements in planning activities concerning legislation and money-raising projects, but the economy at the post office will make it possible to maintain communication throughout the state and county memberships.

County Auxiliaries reported current programs relating to Crime Stop, Personal Safety, International Health, Problem Medical Marriages, Violence on Television, Sexual Assault, Stresses of the 20th Century Physician, Woman Aware, Child Abuse, as well as the continuing training of GEMS (baby sitters) and the Muppets nutrition skits in the schools.

Possible expansion of the Hamer Education Loan Fund to include emergency loans to medical students after their first year of school and in amount equaling existing



Arizona BOMEX Comments

Services vs. Fees

Dear Colleague:

As a portion of the "Medical Malpractice Crisis Legislation" which became law in February of 1976, your Board of Medical Examiners was given additional statutory assignments which may triple our office staff and did increase membership from five M.D.'s to nine M.D.'s., two lay persons and the President of the Arizona Board of Nursing. Many of these jobs were recommended by organized medicine, several were added by the Legislature without asking our advice and all COST MONEY.

With the approval of the Arizona Medical Association, a bill has been introduced to again increase the reregistration fees to a maximum of \$100 per annum in order to acquire the funds needed to carry out these unforeseen conditions imposed on the board. This is not novel or new. Most other states have increased these fees and we are told California is \$125, with Connecticut up to \$200. Nevertheless, you have the solemn vow of the Board, its Director and staff, that we will hold the line when and wherever possible.

To save the cost of printing a budget consisting of twenty-eight pages for each of you, please feel free to visit your Board and review that document any Monday through Friday, from 8:00 a.m. to 5:00 p.m., except statutory holidays.

Fraternally yours,
George Scharf, M.D.
Secretary

criteria was recommended to the state board by the Loan Committee. The board authorized the president to contact ARMA concerning approval to proceed in the matter.

Emphasis was relayed in the encouragement of doctors' wives serving among those local citizens sitting on Health Planning Councils and boards, in addition to being alert to the concerns of these integral groups.

An ad hoc committee was named to evaluate proposals for long range Auxiliary planning; and the developing momentum of the "Spring Roundup 1977" Convention planning was evident in report of the "Creative Moments" Arts and Crafts Show annually open to doctors and wives participation. The Southwestern theme of the convention will feature bandanas with a flair, and the poster displays from each organized county will again present an enlightening "thumbnail" overview of Auxiliaries in action in Arizona.



Vignettes of Prescott

— Physicians

John W. Kennedy, M.D.

John B. Mc Nally, M.D. (1866-1928) practiced in Prescott from 1896 to 1928. He was in some ways a "loner". Although he was never associated in practice with any of the other physicians in Prescott at that time, he had a great following of extremely loyal patients.

One story is that when the Pope was quite ill in Rome his patients thought that if they sent Dr. Mc Nally to attend him he would certainly recover. But the hierarchy never called Dr. Mc Nally and the Pope didn't make it.

Another loyal patient of his was the wife of Senator Henry Ashurst—one of the first Senators from Arizona when Arizona was admitted as a State—who was known for his sonorous sibilant oratory. Dr. Ashurst's wife was such a loyal patient of Dr. Mc Nally that her wish was to be buried in the same cemetery as Dr. Mc Nally. And sure enough it came to pass.

Dr. Mc Nally founded a dynasty of physicians in Prescott with first his son, the late Doctor Joe Mc Nally, and today with two of his grandsons, Dr. Gerald F. Mc Nally and Dr. Joseph B. Mc Nally.

Many of the physicians coming to early Arizona came because of their own health or to improve the health of a member of their family. Dr. John W. Flinn, a graduate of McGill Medical College in 1895, came to Kingman in 1898 from Nova Scotia, arriving in Prescott in 1902 where he resided and practiced until his death. He suffered from tuberculosis himself and on one occasion, when he had an acute relapse, was advised to come down to the Salt River Valley, Phoenix, and spend some time. This he did. On his way home he traveled by way of the Castle Hot Springs Resort (alas, it burned in December of 1976). Here, camping on his way back to Prescott, he met a physician from New York. This physician had acquired tuberculosis as medical students, physicians, nurses, and everybody associated with the health profession at that time were prone to acquire the disease

because of close association with tuberculous patients. At any rate, this professor from Columbia had been forced to come to Arizona because he could not be admitted to Sanarac Lake Sanatorium in upstate New York. He discussed this with Dr. Flinn and suggested that there should be provision somehow for people of moderate means to be under medical supervision when they came to Arizona seeking therapy principally from the salubrious climate. He thought that it should be under medical supervision. This inspired Dr. Flinn, when he returned back to Prescott, to start his own sanatorium which was operated for a good many years by him. He pioneered in the "fresh air" therapy for tuberculosis.

At the meeting of the Arizona Medical Association in 1901, in Phoenix, many papers were read concerning the beneficial effects of Arizona's climate in the cure of kidney diseases and on the treatment of tuberculosis. One prominent physician, Dr. Henry A. Hughes, stated that he hoped that not one more person with the disease would come to Arizona until there was some proper accommodation for their care and some measures adopted that would prevent the spread of the disease. Several doctors argued that if tuberculosis cases had been kept out of Arizona, they themselves would not have been able to receive the benefit of the climate.

There was no unanimity of opinion in regard to the treatment of tuberculosis. Bed rest with minimal exercise and a good food regimen, advocated by Dr. John W. Flinn and practiced in his sanatorium at Prescott, was not condemned but was thought by some to be insufficient. Dr. Flinn never retreated from his opinion that not only he but a great many other physicians of that era had come to Arizona to recover their health and that better conditions for new arrivals should be undertaken.

This physician's son, Dr. Robert S. Flinn, relates that at one public gathering, his father even went so far as to suggest that the Buckey O'Neal statue on the courthouse lawn at Prescott be replaced by a statue to the tubercle bacillus. Now this must have indeed been blasphemy to the ears of Prescott, for the statue is in honor of the Rough Riders. To be sure, Buckey lost his life in Cuba and was a member of the Rough Riders, but this author has been unable to find anything on the monument plaque to indicate that it was intended to be a likeness of Buckey O'Neal. Nonetheless, folklore has it so, and for Dr. Flinn to suggest that the tubercle bacillus should supplant Buckey O'Neal must have raised a few eyebrows. The reason Dr. Flinn suggested this was that the tubercle bacillus had brought to Arizona a great many people who became leaders in communities all over the state, and except for the ubiquitous growing of the tubercle bacillus in their pulmonary tissue, they would have remained elsewhere and not have contributed to the growth and progress of the Territory.



THE MINUTES APPEARING IN THIS SECTION HAVE BEEN EDITED TO CONSERVE SPACE. A COMPLETE COPY OF THE MINUTES OF ANY MEETING WILL BE MAILED TO ANY MEMBER REQUESTING THEM.

EXECUTIVE COMMITTEE

The meeting of the Executive Committee of the Arizona Medical Association, Inc., held at 810 W. Bethany Home Road, Phoenix, AZ on Friday January 28, 1977 convened at 7:06 p.m., Edward Sattenspiel, M.D., president and chairman presiding.

DEPARTMENT OF HEALTH SERVICES

Dr. Dandoy reported that new appointments have been made to the Advisory Health Council. The physicians appointed to the group are: Arthur D. Nelson, M.D.; Dallas C. Allred, M.D.; and Phillip Z. Saba, M.D.

She also reported that the Department has received new Hypertension Screening Program Grant and would like several physicians to advise on the program. Neil O. Ward, M.D. offered to assist in providing such help.

The Director also reported that the Neonatal Transport program is running into some opposition in the finance committee of the legislature and needs help in convincing the legislators of the value of the program.

MALPRACTICE ASSESSMENTS

Requests for exemptions

Mr. Robinson reported that the names of the members who had requested exemption prior to the 12/17/76 meeting had been referred to the appropriate county medical societies to determine if any of the societies objected to the exemption. None of the societies expressed objections.

MEMBERSHIP CERTIFICATE

Dr. Kahle explained the concept of issuing a one-time membership certificate to take the place of an annual membership card. Mr. Robinson reported that it would cost approximately 54 cents each, approximately \$1,405.62 for the present membership.

IT WAS MOVED AND CARRIED TO REFER THIS MATTER TO THE BOARD OF DIRECTORS FOR THEIR CONSIDERATION.

BOMEX NOMINATIONS


The Board of Medical Examiners will have another opening 2/26/77 when Arthur Lindberg, M.D.'s term expires.

It was determined to ask the Maricopa County Medical Society to recommend names for the Board of Directors' meeting on 2/26/77 for further submission to the Governor.

BOMEX REPORTING PROCEDURES

The Pima County Medical Society letter 1/6/77 regarding the Board of Medical Examiners procedure of reporting to all hospitals in Arizona when a physician's hospital privileges have been curtailed for administrative reasons (not completion of medical records) was discussed.

It was pointed out that the Professor Committee is presently working on correcting the problem.



Natural balance doesn't always come naturally

Big Balanced Rock, Chiricahua Mountains, Arizona (approx 1,000 tons)

- **Most Widely Prescribed**—Antivert is the most widely prescribed agent for the management of vertigo* associated with diseases affecting the vestibular system such as Menière's disease, labyrinthitis, and vestibular neuronitis.
- **Relief of Nausea and Vomiting**—Antivert/25 can relieve the nausea and vomiting often associated with vertigo*.
- **Dosage for Vertigo***—The usual adult dosage for Antivert/25 is one tablet t.i.d.

BRIEF SUMMARY OF PRESCRIBING INFORMATION

*INDICATIONS. Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

More detailed professional information available on request.

ROERIG 
A division of Pfizer Pharmaceuticals
New York, New York 10017

Antivert[®]/25 
(meclizine HCl) 25 mg. Tablets
for vertigo*

DYAZIDE[®]

Trademark

Each capsule contains 50 mg. of Dyrenium[®] (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

MAKES SENSE FOR LONG-TERM CONTROL OF HYPERTENSION*



Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

*** WARNING**

This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

*** Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with

cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K⁺ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K⁺ intake. The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy. Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K⁺ frequently; both can cause K⁺ retention and elevated serum K⁺. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium[®] (triamterene, SK&F Co.), and

leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

SK&F CO., Carolina, P.R. 00630
Subsidiary of SmithKline Corporation

TRIAMTERENE CONSERVES POTASSIUM WHILE HYDROCHLOROTHIAZIDE LOWERS BLOOD PRESSURE

COUNTY	TOTAL BILLED	TOTAL PAID	% OF TOTAL BILLED	OTHER RESPONSE	ACCOUNTED FOR	% OF TOTAL BILLED
Apache	10	10	100.0		10	100.0
Chino	30	24	80.0	5	29	96.7
Cocino	54	48	88.9	4	52	96.3
Coconino	11	9	81.8	1	10	90.9
Graham	7	6	85.7	1	7	100.0
Greenlee	9	9	100.0		9	100.0
Maricopa	1317	1231	93.5	* 59	1290	97.9
Mohave	28	24	85.7	3	27	96.4
Navajo	6	6	100.0		6	100.0
Pima	564	505	89.5	41	546	96.8
Pinal	33	27	81.8	5	32	97.0
Santa Cruz	6	5	83.3	1	6	100.0
Yavapai	42	34	81.0	6	40	95.2
Yuma	48	41	81.4	5	46	95.8
TOTAL	2165	1979	91.5%	131	2110	97.5%

Collected to date: 197,970.00

CITIZENS ASSERTIVE ACTIONS FOR PODIATRY REFORM LEGISLATION

Ms. Donna Diaz's letter of 1/15/77 was reviewed and it was determined to refer this matter to the legislative Committee for action.

UTO RESTRAINT DEVICES FOR INFANTS

Hugh C. Thompson, M.D.'s letter of 12/28/76 regarding the subject matter was reviewed.

IT WAS MOVED AND CARRIED TO REFER THIS MATTER TO THE BOARD OF DIRECTORS EXECUTIVE COMMITTEE'S RECOMMENDATION IN FAVOR OF ENDORSEMENT.

A.M.A. LEADERSHIP CONFERENCE

Dr. Kahle reported on the recently held leadership conference and suggested that a concerted effort be made to get more of the county medical society leadership to attend next year's conference.

MICA ANNUAL MEETING

Dr. Sattenspiel reported on the plans for the upcoming policyholders meeting scheduled for 1/7/77 and urged the committee members to attend.

LEGISLATIVE COMMITTEE

Meeting of the Legislative Committee of the Arizona Medical Association, held Saturday, February 5, 1977 at 810 West Bethany Home Road, Phoenix, Arizona, convened at 1:26 p.m., Selma E. Rogovnik, M.D., Chairperson, presiding.

REVIEW OF LEGISLATIVE ACTIVITY

Mr. Barnett informed the committee that since session convened on January 10, most of the bills considered during the previous meeting, have in fact, been introduced however to date, not considered by committees in either the House or Senate. The period of indoctrination for new members to the House and Senate appears to be over and the legislature is now in full swing, and we anticipate active committee hearings.

IMMUNITY—CONFIDENTIALITY OF ASSOCIATIONS COMMITTEE PROCEEDINGS AND RECORDS

During the last meeting, the committee reviewed legal opinion by the firm of Snell & Wilmer, in which it was considered that the records and proceedings of the Association's committees, are probably not confidential, and determine to actively support the introduction of legislation providing confidentiality of records and proceedings of professional Associations committee activities. Mr. Jacobson provided draft legislation to the committee which would provide civil immunity and confidentiality to the peer review activities of professional societies of health care providers.

IT WAS MOVED AND CARRIED TO SUPPORT THE INTRODUCTION AND PASSAGE OF DRAFT LEGISLATION WHICH WOULD PROVIDE CIVIL IMMUNITY AND CONFIDENTIALITY TO THE PEER REVIEW ACTIVITIES OF PROFESSIONAL SOCIETIES OF HEALTH CARE PROVIDERS.

BOMEX—INCREASE IN REREGISTRATION FEE

During the last meeting, the Legislative Committee considered a request by the Board of Medical Examiners, to increase the maximum annual reregistration fee from \$50.00 to \$100.00. At that meeting, Mr. Boykin informed the committee that he would be in a much better position to determine budgetary needs after the reregistration for 1977 had been completed, approximately February 1, 1977. For that reason, the committee moved the BOMEX request to the next meeting's agenda.

The committee received the following letter from Mr. Boykin dated February 3, 1977 concerning the increase in reregistration fees:

"Please find attached some statistical data, covering actual expenditures and income for the Board's fiscal year, July 1, 1975 to June 30, 1976; expenditures and income for the first seven (7) months of fiscal 1976-1977; and anticipated expenditures and income for the balance of 1977-78. Our budget covering this current fiscal year was prepared in August of 1976, so you can readily visualize the difficulty in such proposals being formulated twenty to twenty-four months in advance and at least six months prior to legislative review.

You will note that the current staff of BOMEX consists of fourteen full time employees and twelve Board members, while 1976-1977 fiscal appropriations call for nineteen staff members to carry out legislative directives including the provisions for a staff attorney, law clerk and a legal stenographer, along with other necessary personnel to provide for the normal increases of the Board's services. Some of these persons have not been employed to date due to financial limitations.

On adoption of the "Medical Malpractice Crisis Legislation" in February of 1976, with its added directives to the Board, we estimated we would need a maximum of twenty-five staff members to effectively conduct the Board's business and again this was prescribed by our proposed budget prepared in August, 1976, to become effective in fiscal 1977-1978.

Should the reregistration fee on that anticipated budget remain at \$50 per annum, we are obviously short of funds without any means of continuing to operate beyond March 1, 1978, and would effectively be out of business on July 1, 1977.

It appears to me that only two avenues are open to the Association and the medical profession. First, and I sincerely believe (along with the entire Board of Medical Examiners which has approved all of these budgets) that a legislative amendment to Arizona Revised Statutes, Section 32-1431.8., as amended, increasing reregistration fees, is the only one. The second would require the Board to inform the Arizona Medical Association and the legislature that it could not carry out its prescribed duties with available funds.

I would urge the Association to give every consideration to assuming a position which would permit medicine and state (in the form of the Board) to continue the relationships, coordinated programs, and cooperation which is second to none currently in existence throughout the entire United States."

The enclosed statistical data and organizational charts are on file in the Association's headquarters office. Considerable discussion ensued.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO LEGISLATION WHICH WOULD PROVIDE THE BOARD OF MEDICAL EXAMINERS WITH AN INCREASE IN REREGISTRATION FEE FROM A MAXIMUM OF \$50. TO \$100.

CONSIDERATION OF LEGISLATION House Bill 2087 - Annual Appropriations for Bomex.

HB 2087 would provide that the budget of the Board of Medical Examiners and other ninety-two agencies would be subject to annual fiscal review by the Legislature and that such appropriations as it may make, shall be construed as the Legislature's intended funding level for such budget.

IT WAS MOVED AND CARRIED TO ACTIVELY NON-SUPPORT HOUSE BILL 2087.

House Bill 2112 - Insurance Benefits for Services Performed at Health Care Institutions.

HB 2112 would provide that benefits may not be denied for certain services performed in a licensed health care institution. The purpose and effects of the legislation was not determined.

IT WAS MOVED AND CARRIED TO TABLE ACTION ON HOUSE BILL 2112.

House Bill 2058 - Evaluation of New Medical Drugs—Laetrile.

House Bill 2059 - Laetrile.

This legislation provides for the evaluation of new medical drugs, and specifically the investigation of laetrile. HB 2059 provides that laetrile may be manufactured, offered and sold in Arizona.

IT WAS MOVED AND CARRIED TO

ACTIVELY NON-SUPPORT HOUSE BILL 2058 AND 2059 CONCERNING LAETRILE.

House Bill 2097 - Insurance: Limitation on Reduction of Benefits.

House Bill 2097 would provide that insurance companies would no longer be able to coordinate benefits to a maximum of 100% of the expenses incurred rather the company would be required to allow the full benefits.

IT WAS MOVED AND CARRIED TO GENERALLY SUPPORT HOUSE BILL 2097.

Senate Bill 1055 - Optometrists.

Senate Bill 1055 provides for changes in the Board of Optometry increasing its membership to five (5) members, with one (1) lay person and prescribing changes in the qualifications, examinations and fees for the Optometrist.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1055.

Senate Bill 1062 - Licensing of Marriage and Family Counselors.

This legislation provides for the licensing of marriage and family counselors by the Department of Health Services.

IT WAS MOVED AND CARRIED TO GENERALLY SUPPORT SENATE BILL 1062 - LICENSING OF MARRIAGE AND FAMILY COUNSELORS.

House Bill 2114 - Credentialing of Allied Health Professions.

Legislation was introduced which would provide for the credentialing of allied health professions within the Department of Health Services. Conversation with legislators causing the introduction of this legislation indicates that there will be considerable changes in the concept of this legislation.

IT WAS MOVED AND CARRIED TO TABLE CONSIDERATION OF HOUSE BILL 2114 - CREDENTIALING ALLIED HEALTH PROFESSIONS.

House Bill 2113 - Blood Banks Exemption of State Licensure.

House Bill 2113 provides exemption for federally licensed and regulated blood banks from licensure or supervision as health care institutions by the Department of Health Services. It was not known whether the Department of Health Services was in support of this legislation.

IT WAS MOVED AND CARRIED TO TABLE CONSIDERATION OF HOUSE BILL 2113.

Highways - Signs Indicating Hospital Exits

Mr. Barnett informed the committee that the Hospital Association is introducing legislation which will provide for signs on interstate highways indicating the exits leading to hospitals. Discussion indicated that there was a need for signs leading to hospitals off the interstate highways as well.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT THE ARIZONA HOSPITAL ASSOCIATION'S PROPOSED LEGISLATION TO PROVIDE FOR SIGNS ON THE INTERSTATE HIGHWAYS INDICATING EXITS FOR HOSPITALS.

Senate Bill 1023 - Sex Crimes

Senate Bill 1023 rewrites the portion of the criminal code concerning the prohibition and regulation of prostitution, certain obscenity offenses and family offenses. Considerable discussion ensued.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1023.

Senate Bill 1189 - Podiatry Reform Legislation.

Proposed legislation was considered as prepared by the Citizens Assertive Action for Podiatry Reform Legislation which would greatly restrict the practice of Podiatry in this state.

IT WAS MOVED AND CARRIED TO OFFER GENERAL NON-SUPPORT TO THE PODIATRY REFORM LEGISLATION AS OFFERED BY THE CITIZENS ASSERTIVE ACTION FOR PODIATRY REFORM LEGISLATION.

House Bill 2149 - Psychologist - Insurance.

This legislation provides that when an insurance contract provides for, or offers reimbursement for any service which is within the lawful scope of the practice of a duly certified psychologist, a subscriber covered under such contract, shall have the freedom of choice to select either a physician or certified psychologist to provide examination, care or treatment. This legislation has been introduced on previous occasions, and after consideration by this Association, received active non-support.

IT WAS MOVED AND CARRIED TO ACTIVELY NON-SUPPORT HOUSE BILL 2149.

Senate Bill 1144 - Medical Service Corporations.

This bill would require representation of the general public on boards of directors of hospital, medical, dental and optometric service corporations and expand them to require that such public members be elected by subscribers and compose at least 2/3rds of the membership of such boards. This statute, if enacted would affect Arizona Blue Cross, Arizona Blue Shield as well as prepaid dental and optometric insurance plans.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1144 CONCERNING MEDICAL SERVICE CORPORATIONS.

Definition of Death.

Mr. Barnett informed the committee that it appears that legislation will be introduced which will place into statute, the "definition of death". Copy of proposed legislation is unavailable at this time. It was noted that this subject has been considered by the American Medical Association as recent as it's annual meeting in June of 1976 at which time it reaffirmed its established policy that "statutory definition of death is neither desirable nor necessary".

IT WAS MOVED AND CARRIED TO TABLE CONSIDERATION OF PROPOSED LEGISLATION TO STATUTORILY DEFINE DEATH.

PUBLISHING COMMITTEE

Meeting of the Publishing Committee of the Arizona Medical Association, held Saturday, February 26, 1977, at 810 West Bethany Home Road, Phoenix, convened at 1:05 p.m., John W. Kennedy, M.D., Chairman, presiding.

Continuation of Publication

Resolution #9-76 adopted by the 1976 House of Delegates of ArMA was discussed. The following action resulted:

IT WAS MOVED AND CARRIED THAT THE PUBLISHING COMMITTEE STRONGLY RECOMMEND TO THE ArMA BOARD OF DIRECTORS THAT PUBLICATION OF ARIZONA MEDICINE BE CONTINUED.

Western Journal of Medicine

Letter of December 2, 1976 from *Western Journal of Medicine* proposing possible merger of our two

publications was discussed. The consensus that at the present time we should not make a decision on a merger but should await the decision of the House of Delegates regarding continuation of publication. Letter is to be written to *Western Journal of Medicine* so advising them.

Editorial Policies

1. Review Editors

Policy of having original articles edited and discussed. Consensus was that this is a generally accepted procedure.

2. Bibliographies

Several letters were reviewed from physicians taking exception to the policy of eliminating bibliographies. It was pointed out that *JA* allows 20 references, and that most journal print references, occasionally in very large numbers. After considerable discussion, the following action was taken:

IT WAS MOVED AND CARRIED THAT REFERENCES BE INCLUDED BUT LIMITED TO TWENTY IN NUMBER, WITH THE PROVISION THAT THE NUMBER CAN BE JUSTIFIED UPWARD AT THE DISCRETION OF THE EDITOR.

It was also determined that we continue to encourage authors to be succinct in use of references as well as in text.

Associate Editor

Dr. Comerchi reported that in response to a request from Dr. Kennedy, the University of Arizona expressed interest in participating as Associate Editor of *Arizona Medicine*. Names of candidates for this position are currently being sought. Comerchi agreed to act temporarily as Associate Editor from the University until the new editor of *Arizona Medicine* takes office, at which time names will be submitted from the University for consideration by the editor.

Dr. Comerchi is presently putting together the May issue and was advised that this issue is completely in his charge and he may eliminate regular features as he desires.

Bomex Page

Letter of January 4, 1977 from Paul Bomex requesting consideration of a monthly page in *Arizona Medicine* to be prepared by the Board of Medical Examiners was discussed.

IT WAS MOVED AND CARRIED TO PROVE THE REQUEST OF THE BOARD OF MEDICAL EXAMINERS.

Printing

Report of Mr. Robinson on quotations from various firms for printing of *Arizona Medicine* was reviewed. It was noted that there is not a great deal of variation in prices. Mr. Robinson's recommendation is to continue with Publishers Printing, Inc. for six months to see if they will improve quality as they have promised.

IT WAS MOVED AND CARRIED TO ACCEPT THE RECOMMENDATION OF THE MANAGING EDITOR TO REMAIN WITH THE PRESENT PRINTING FIRM FOR A PERIOD OF SIX MONTHS AND RE-EVALUATE AT THAT TIME.

Acknowledgements

Dr. Kennedy wished to express his thanks to the Publishing Committee for their support during his tenure as editor.

IT WAS MOVED AND CARRIED TO EXPRESS THE APPRECIATION OF THE PUBLISHING COMMITTEE FOR THE EFFORTS OF DR. KENNEDY AS EDITOR IN CHIEF OVER THE PAST SEVERAL YEARS.

NOMINATING COMMITTEE

meeting of the Nominating Committee of the Arizona Medical Association, Inc. held at 810 West any Home Road, Phoenix, Arizona, on Friday February 12, 1977, a quorum being present, convened at 2:14 p.m., William C. Scott, Past President and Chairman, presiding.

Nominations

Following a review of the bylaws regarding nominating restrictions, the following slate of officers were nominated:

Offices in Office	Nominees
President-Elect (1977-78)	Richard L. Dexter, M.D. William S. Masland, M.D.
President (1977-78)	William E. Crisp, M.D. E. Henry Running, M.D.
Secretary (1977-78)	Derrill B. Manley, M.D. Richard D. Zonis, M.D.
Treasurer (1977-78)	John T. Clymer, M.D. Richard F. Dahlen, M.D.
Speaker of the House (1977-78)	Robert A. Price, M.D. John A. Ash, M.D.
Editor-in-Chief (1977-78)	Marshall B. Block, M.D. John R. Green, M.D.
Delegate to AMA (1/78-12/31/79)	Edward Sattenspiel, M.D. Patrick P. Moraca, M.D.
Delegate to AMA (1/78-12/31/79)	W. Scott Chisholm, M.D. Theodore L. Mobley, M.D.
Alternate Delegate to AMA (1/78-12/31/79)	John B. Jamison, M.D. Bruce N. Curtis, M.D.
Alternate Delegate to AMA (1/78-12/31/79)	William R. Myers, M.D. Robert T. Phillips, M.D.
Central District Director (1977-80) (Maricopa)	James M. Hurley, M.D. John C. Bull, Jr., M.D.
Northeastern District Director (1977-80) (Mohave, Graham, Greenlee, Santa Cruz)	Edward R. Curtis, M.D. Robert V. Horan, M.D.
Western District Director (1977-80) (Pima)	Richard S. Armstrong, M.D. William D. Carrell, M.D.
Western District Director (1977-79) (Pima)	Joseph S. Whaley, M.D. Neopito L. Robles, M.D.
Western District Director (1977-78) (Pima)	Jack M. Layton, M.D. C. Donald Christian, M.D.
Southwestern District Director (1977-80) (Imperial, Yuma)	James F. Martin, M.D. Alan C. Winfield, M.D.

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VASODILAN[®]

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the compatible vasodilator

TABLETS, 20 mg.

***Indications:** Based on a review of this drug by the National Academy of Sciences-National Research Council and/or other information, the FDA has classified the indications as follows:

Possibly Effective:

1. For the relief of symptoms associated with cerebral vascular insufficiency.
2. In peripheral vascular disease of arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's Disease) and Raynaud's disease.

Final classification of the less-than-effective indications requires further investigation.

Dosage and Administration: Oral: 10 to 20 mg., three or four times daily

Intramuscular: 5 to 10 mg. (1 or 2 ml.) two or three times daily. Intramuscular administration may be used initially in severe or acute conditions.

Contraindications and Cautions: There are no known contraindications to oral use when administered in recommended doses. Should not be given immediately postpartum or in the presence of arterial bleeding.

Parenteral administration is not recommended in the presence of hypotension or tachycardia.

Intravenous administration should not be given because of increased likelihood of side effects.

Adverse Reactions: On rare occasions oral administration of the drug has been associated in time with the occurrence of hypotension, tachycardia, nausea, vomiting, dizziness, abdominal distress, and severe rash. If rash appears the drug should be discontinued.

Although available evidence suggests a temporal association of these reactions with isoxsuprine, a causal relationship can be neither confirmed nor refuted.

Administration of single dose of 10 mg. intramuscularly may result in hypotension and tachycardia. These symptoms are more pronounced in higher doses. For these reasons single intramuscular doses exceeding 10 mg. are not recommended. Repeated administration of 5 to 10 mg. intramuscularly at suitable intervals may be employed.

Supplied: Tablets, 10 mg., bottles of 100, 1000, 5000 and Unit Dose; Tablets, 20 mg., bottles of 100, 500, 1000, 5000 and Unit Dose; Injection, 10 mg. per 2 ml. ampul, box of six 2 ml. ampuls.

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A MESSAGE TO MY PATIENTS

Unfortunately, I find that the excessive use of alcohol is a problem with some of my patients. Alcohol abuse by itself is a hazard to health, but when combined with driving it is particularly dangerous. Today, alcohol-related highway crashes rank right after cancer and heart disease as a leading cause of death among Americans.

The first step in controlling alcohol abuse is self-awareness. I therefore urge any of my patients who are concerned about their drinking problem to discuss it with me.

Even if you don't have a drinking problem, you could be killed or injured if you drive after too much to drink. So, for your good health and safety, stop and think. Are you taking unnecessary risks by driving after excessive drinking or by riding with others who occasionally drink too much?

A MESSAGE TO MY PATIENTS

Alcohol Crashes Rank High as Killers

Today the leading causes of death are degenerative diseases usually associated with advancing age. But automobile accidents have now moved up to the point where they are challenging far the lead. Each year, 28,000 Americans die and thousands more are injured in highway accidents involving alcohol. In fact, because vehicle crashes kill and injure the young as well as old, they are equalled only by heart disease as the major single factor in lost man-years of productivity. And among persons under 35, highway crashes are the major single cause of death.

You May Not Recognize the Risk

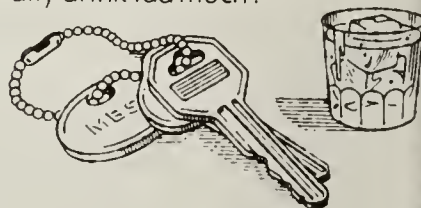
How many times have you taken too many drinks, gotten into your car and driven home? Or

driven with somebody who has been drinking too much? People who drink excessively and drive can increase their risk of a crash by 25 times or more.

Talk to Your Doctor

If the amount of your drinking is a concern to you, feel free to talk to me. Medication, counseling or therapy can be of help.

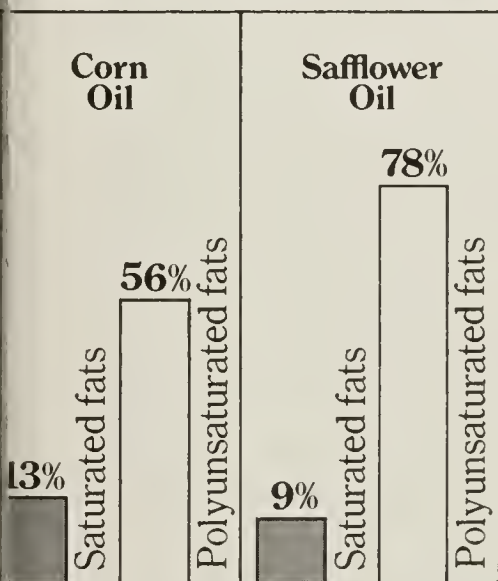
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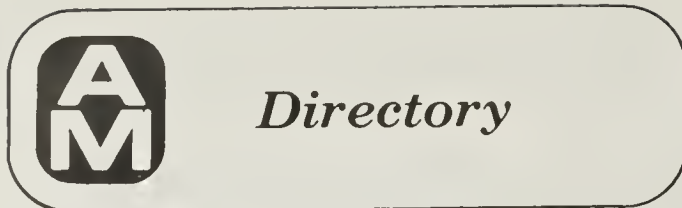
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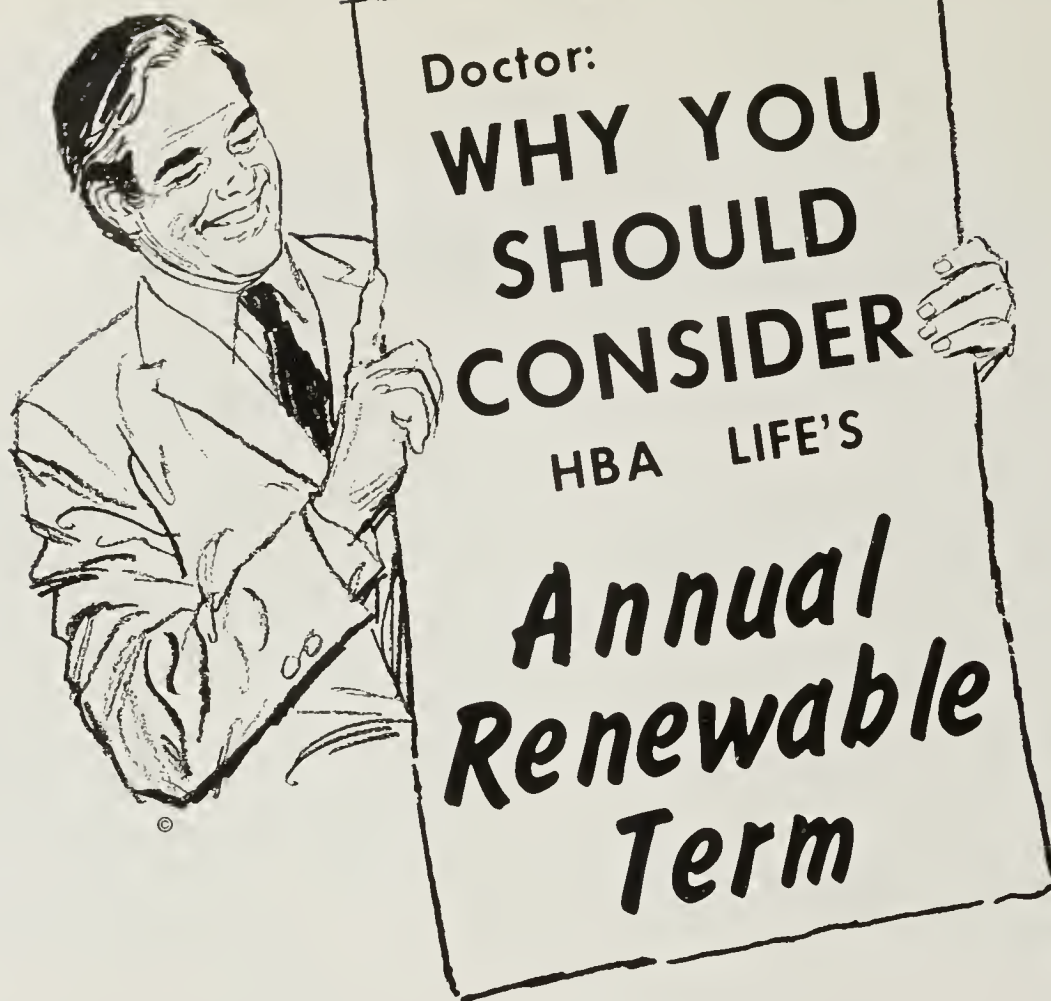
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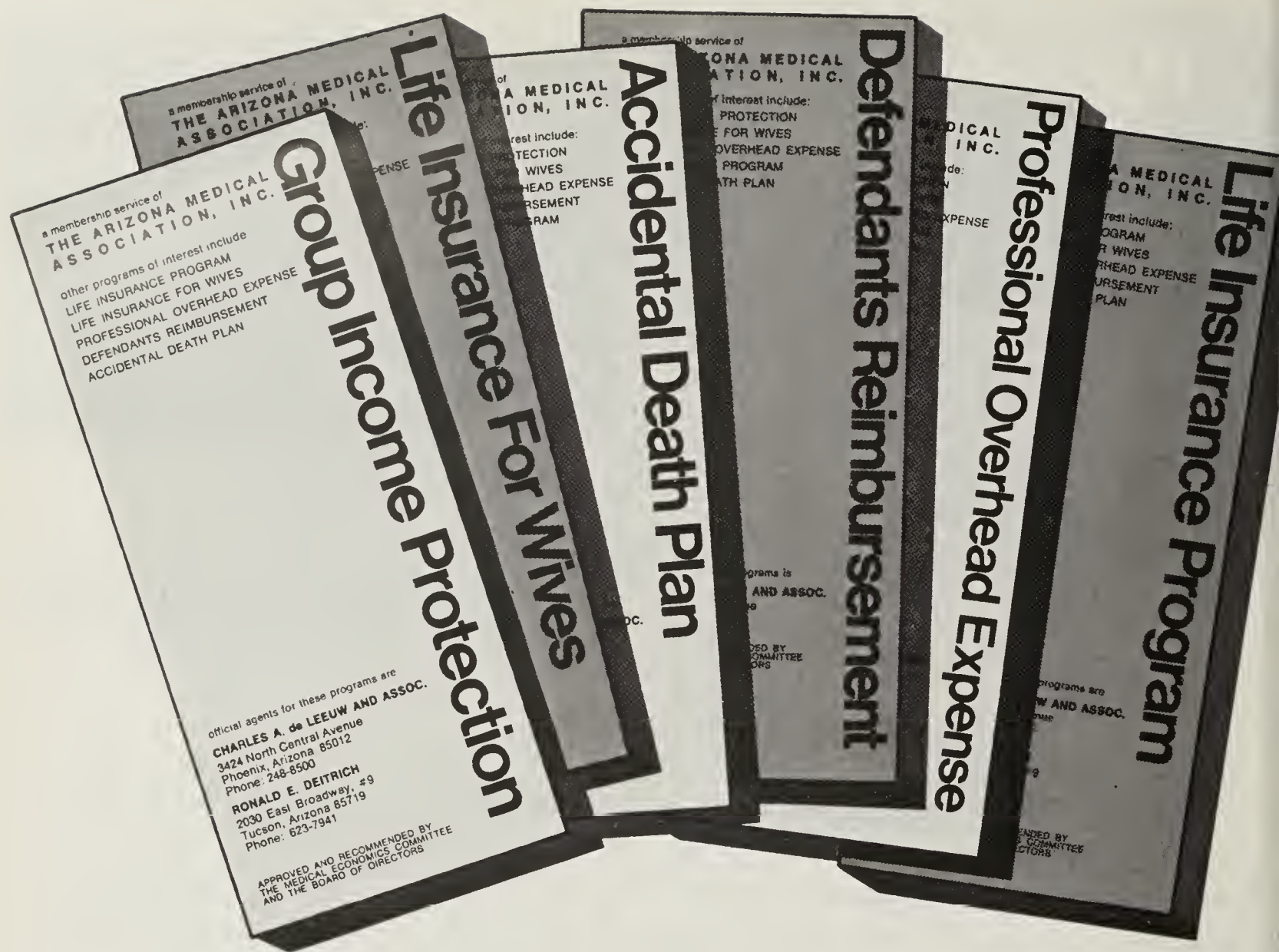
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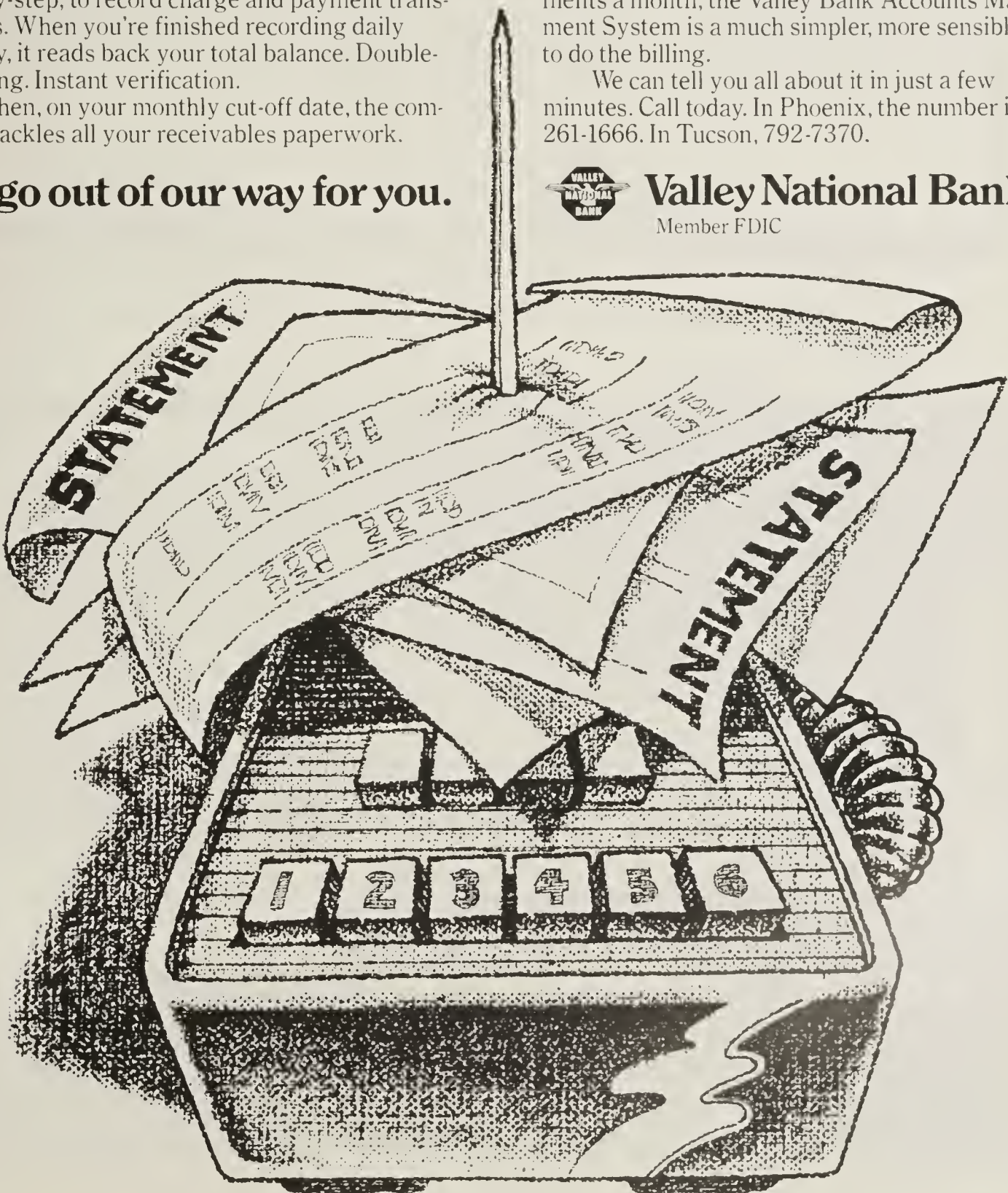
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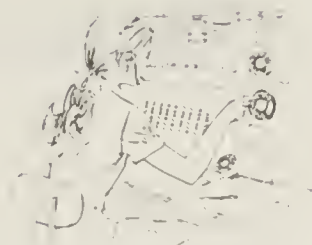
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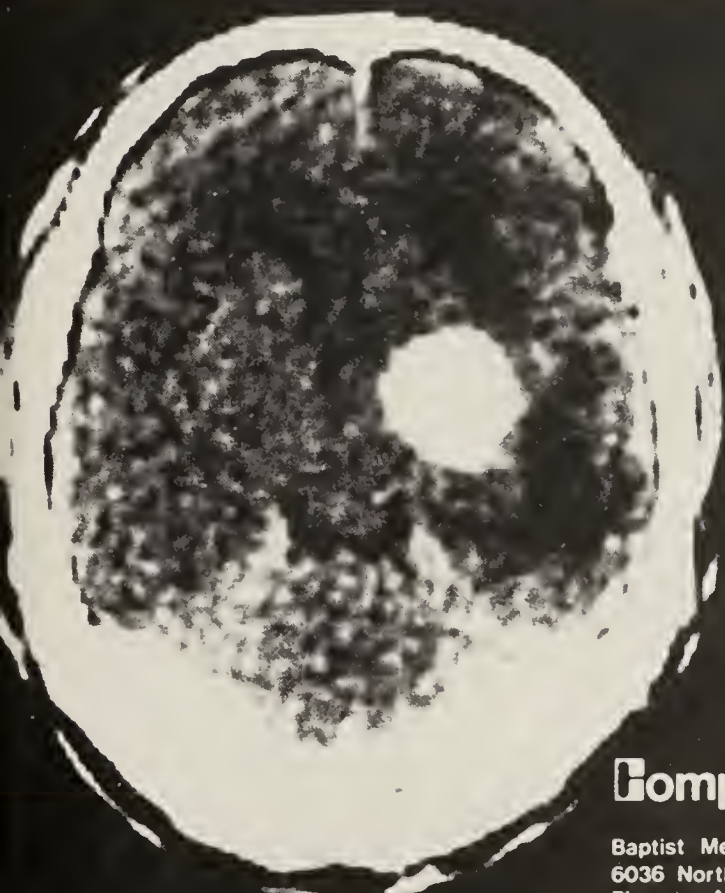


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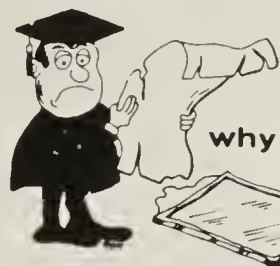


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TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM, TUCSON
U. OF A. HEALTH SCIENCES CENTER
VETERANS ADMINISTRATION CENTER, PRESCOTT
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CURRENT CONCEPTS: ASTHMA 1977
May 7, 1977, Westwood Look Hotel, Tucson, AZ. Sponsor: Arizona Thoracic Society. Contact: Robert W. Shook, M.A., 1239 E. McDowell Road, Phoenix, AZ 85006. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL AND PSYCHOLOGICAL MANAGEMENT OF LYMPHOMAS AND ACUTE LEUKEMIA

May 14, 1977, Auditorium, U of A Hospital, 1501 N. Campbell, Tucson, AZ. Sponsor: Leukemia Society of America, Inc. Contact: Mary Lou Passmore, 3318 N. 2nd St., Phoenix AZ 85012. Approved for 5 required hours toward the ArMA Certificate in Continuing Medical Education.

MONTHLY OR WEEKLY

OFFICE PSYCHIATRY FOR THE PRIMARY PROVIDER

2nd Monday of month, 4811 N. 7th Street, Phoenix AZ. Sponsor: Arizona Health Plan. Contact: T. R. Bittker, M.D., Box 5000, Phoenix, AZ 85010. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Society. Contact: Mrs. Mary Wood, 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 2 required hours per session toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tucson Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine & Dept. of IM, Dermatology Sect. Contact: Peter Lynch, M.D., U of A College of Medicine, Tucson, AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U of A College of Medicine, Dept. of Internal Medicine, Clinical Immunology Section. Contact: John Boyer, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd & 5th Thursday — Rm. N318, VA Hospital, 2nd & 4th Thursday, Rm. 6505, Tucson Medical Center. Sponsor: U of A College of Medicine, Department of Internal Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th Tuesdays — Rm. 6505, AZ Medical Center. 2nd & 4th Tuesdays — Rm. N318, Veterans Adm. Hospital. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Sidney Salmon, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

GRAND WARD ROUNDS — TRAUMA

Every Tuesday, 8 a.m. Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Surgery Dept., Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room 4410, Arizona Medical Center, Tucson, AZ. Sponsor: Division of Ophthalmology, U of A College of Medicine. Contact: H. E. Cross, M.D., Ph.D., Arizona Medical Center, Dept. of Surgery, Tucson, AZ. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd, 5th Wednesday — Staff Conf. Rm., VA Hospital. 2nd & 4th Wednesday — Rm. 5403, Arizona Medical Center. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Jay Smith, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm. 8403, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine Dept. of Psychiatry. Contact: Alan Levenson, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 1/2 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Dept. of Surgery Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State Hospital, Phoenix, AZ. Sponsor: Arizona State Hospital. Contact: Howard E. Wulsch, M.D., Arizona State Hospital, 2500 E. Van Buren, Phoenix, AZ 85008. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

SURGICAL GRAND ROUNDS

4TH TUESDAY OF EACH MONTH
Hospital Auditorium, Baptist Hospital, Phoenix. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 60 N. 19th Ave., Phoenix, AZ 85015. Approved for 1 1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE

Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 5055 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MELBACK HOSPITAL CLINICAL CONFERENCE

Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Stuart M. Gould, Jr., M.D., Medical Director, Camelback Hospital, 55 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

INTER TRANSFERENCE GROUP
Weekly, Thurs. 8-10 p.m. Sponsor: Phoenix Psychiatric Council. Contact: James E. Campbell, M.D., 5051 N. 34th St., Phoenix, AZ 85018. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DESERT SAMARITAN HOSPITAL
Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Gatti, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS

Wednesdays — 12 Noon. D-5 North Conference Rm., Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE
Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 55 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Every other Wed. AM Begin 7/3/74. Maryvale Samaritan Hospital, Phoenix, AZ. Sponsor: Medical Staff Maryvale Hospital. Contact: Thomas J. Groves, M.D., 6037 W. 1st St., Phoenix, AZ 85033. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TUMOR BOARD CONFERENCE

Every Friday at Noon, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Phoenix Memorial Hospital. Contact: Howard Kimball, M.D., 333 West Thomas Road, Phoenix, AZ 85013. Approved for credit toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Third Monday of the Month, 6:30 p.m., Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 1201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS

Last Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U of A Medical Center, Dept. of Radiology. Contact: Irwin M. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE

1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MORBIDITY & MORTALITY CONFERENCE

2nd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CLINICAL PATHOLOGICAL CONFERENCE

4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

3rd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

GRAND ROUNDS

Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Sponsor: Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Century Medical Plaza, Suite 160, 1701 West St. Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.

GI CONFERENCE

(Special Program with U of A Consultants) 4th Friday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

G.I.-RADIOLOGY CLINICAL CORRELATION CONFERENCE

1st and 3rd Monday, 1 p.m. - C435. Sponsor: VA Hospital, Phoenix, AZ. Contact: Jasper L. McPhail, M.D., Veterans Administration Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

GASTROENTEROLOGY CONFERENCE

1st and 3rd Tuesday, 1 p.m. - T-5. Sponsor: VA Hospital Phoenix, Contact: Jasper L. McPhail, M.D. VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

2nd Thursday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CLINICOPATHOLOGY CONFERENCE

4th Thursday of 3rd Mo. (Mar., Jun., Sept. & Dec.), 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Education.

MEDICAL-SURGICAL CHEST CONFERENCE

1st and 3rd Thursday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CANCER SYMPOSIUM (formerly Tumor Board)

Each Wednesday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

SURGERY-PATHOLOGY CONFERENCE

Each Thursday - 7 a.m. - 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CONFERENCE

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HEPATOLOGY CONFERENCE

2nd and 4th Tuesday - 1 p.m. - 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

UROLOGY-PATHOLOGY CONFERENCE

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Contraindications: Patients with known hypersensitivity to the drug.

Warnings: Caution patients against possible combined effects with alcohol and other CNS depressants. As with all CNS-acting drugs, caution patients against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Though physical and psychological dependence have rarely been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions), following discontinuation of the drug and similar to those seen with barbiturates, have been reported.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psycho-

Libritabs® (chlordiazepoxide) available in 5 mg, 10 mg and 25 mg tablets.



tropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (e.g., excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relation-

ship has not been established clinically.

Adverse Reactions: Drowsiness, ataxia and confusion may occur, especially in the elderly and debilitated. These are reversible in most instances by proper dosage adjustment, but are also occasionally observed at the lower dosage ranges. In a few instances syncope has been reported. Also encountered are isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent and generally controlled with dosage reduction; changes in EEG patterns (low-voltage fast activity) may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice and hepatic dysfunction have been reported occasionally, making periodic blood counts and liver function tests advisable during protracted therapy.

Usual Daily Dosage: Individualize for maximum beneficial effects. *Oral—Adults:* Mild and moderate anxiety and tension, 5 or 10 mg *t.i.d.* or *q.i.d.*; severe states, 20 or 25 mg *t.i.d.* or *q.i.d.* *Geriatric patients:* 5 mg *b.i.d.* to *q.i.d.* (See Precautions.)

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Arizona Medicine

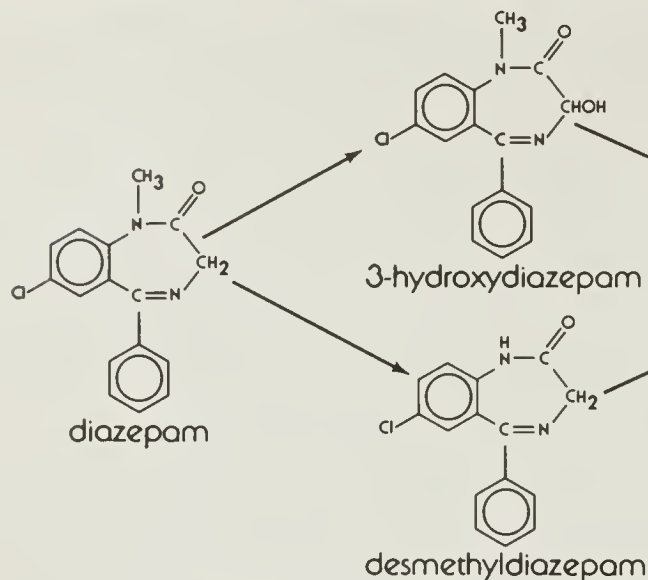
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tension and anxiety**

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Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due

to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome; convulsive disorders (not for sole therapy).

Contraindicated:

Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma;

may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients.

Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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A MESSAGE TO MY PATIENTS

Unfortunately, I find that the excessive use of alcohol is a problem with some of my patients. Alcohol abuse by itself is a hazard to health, but when combined with driving it is particularly dangerous. Today, alcohol-related highway crashes rank right after cancer and heart disease as a leading cause of death among Americans.

The first step in controlling alcohol abuse is self-awareness. I therefore urge any of my patients who are concerned about their drinking problem to discuss it with me.

Even if you don't have a drinking problem, you could be killed or injured if you drive after too much to drink. So, for your good health and safety, stop and think. Are you taking unnecessary risks by driving after excessive drinking or by riding with others who occasionally drink too much?

Alcohol Crashes Rank High as Killers

Today the leading causes of death are degenerative diseases usually associated with advancing age. But automobile accidents have now moved up to the point where they are challenging for the lead. Each year, 28,000 Americans die and thousands more are injured in highway accidents involving alcohol. In fact, because vehicle crashes kill and injure the young as well as old, they are equaled only by heart disease as the major single factor in lost man-years of productivity. And among persons under 35, highway crashes are the major single cause of death.

You May Not Recognize the Risk

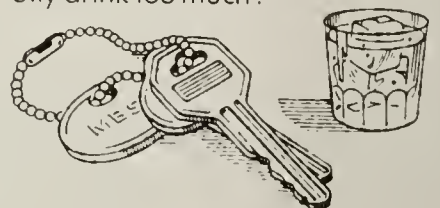
How many times have you taken too many drinks, gotten into your car and driven home? Or

driven with somebody who has been drinking too much? People who drink excessively and drive can increase their risk of a crash by 25 times or more.

Talk to Your Doctor

If the amount of your drinking is a concern to you, feel free to talk to me. Medication, counseling or therapy can be of help.

Even if you don't have a drinking problem, you could be killed or injured if you drive after too much to drink. So, for your good health and safety, stop and think. Are you taking unnecessary risks by driving after excessive drinking or by riding with others who occasionally drink too much?



A MESSAGE
TO MY PATIENTS



MAY 1977 / Vol. 34 No. 5

ARIZONA MEDICINE

JOURNAL OF ARIZONA MEDICAL ASSOCIATION

MEDICAL SOCIETY OF THE UNITED STATES AND MEXICO

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Published monthly by The Arizona Medical
Association, Inc., with offices at 810 W.
Thyng Home Rd., Phoenix, Arizona 85013.
Subscription \$20 a year, single copy \$2.00.
Second class postage paid at Phoenix, Ari-
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The Common Denominator
of Health Progress
RESEARCH

Mailgram

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.



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Each tablet contains 130 mg theophylline, 24 mg ephedrine hydrochloride, and 8 mg phenobarbital

Each tablet contains 180 mg anhydrous theophylline (90 mg in the immediate release layer and 90 mg in the sustained release layer), 48 mg ephedrine hydrochloride (16 mg in the immediate release layer and 32 mg in the sustained release layer), and 25 mg phenobarbital in the immediate release layer

Each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine HCl, and 2 mg phenobarbital; the alcohol content is 15%

See next page for brief summary

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T-GP-72-E

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CAUTION: Federal law prohibits dispensing Tedral SA without prescription.

Description. Tedral: each tablet contains 130 mg theophylline, 24 mg ephedrine hydrochloride, and 8 mg phenobarbital.

Tedral SA: each tablet contains 180 mg anhydrous theophylline (90 mg in the immediate release layer and 90 mg in the sustained release layer); 48 mg ephedrine hydrochloride (16 mg in the immediate release layer and 32 mg in the sustained release layer); 25 mg phenobarbital in the immediate release layer.

Tedral Elixir: each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine hydrochloride, and 2 mg phenobarbital; the alcohol content is 15%.

Indications. Tedral, Tedral SA, and Tedral Elixir are indicated for the symptomatic relief of bronchial asthma, asthmatic bronchitis, and other bronchospastic disorders. They may also be used prophylactically to abort or minimize asthmatic attacks and are of value in managing occasional, seasonal or perennial asthma.

Tedral SA (Sustained Action) offers the convenience of b.i.d. dosage.

Tedral Elixir is convenient for persons who may have difficulty in swallowing tablets.

These Tedral formulations are adjuncts in the total management of the asthmatic patient. Acute or severe asthmatic attacks may necessitate supplemental therapy with other drugs by inhalation or other parenteral routes.

Contraindications. Sensitivity to any of the ingredients; porphyria.

Warnings. Drowsiness may occur. PHENOBARBITAL MAY BE HABIT-FORMING.

Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

Average Dosage. *Prophylactic or Therapeutic.*

Tedral: *Adults*—One or two tablets every 4 hours. *Children*—(Over 60 lb) one-half the adult dose.

Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: *Note:* One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

Supplied. Tedral: White, uncoated scored tablets in bottles of 24 (N 0047-0230-24), 100 (N 0047-0230-51) and 1000 (N 0047-0230-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0230-11).

Tedral SA: Double-layered, uncoated, coral/mottled white tablets in bottles of 100 (N 0047-0231-51) and 1000 (N 0047-0231-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0231-11).

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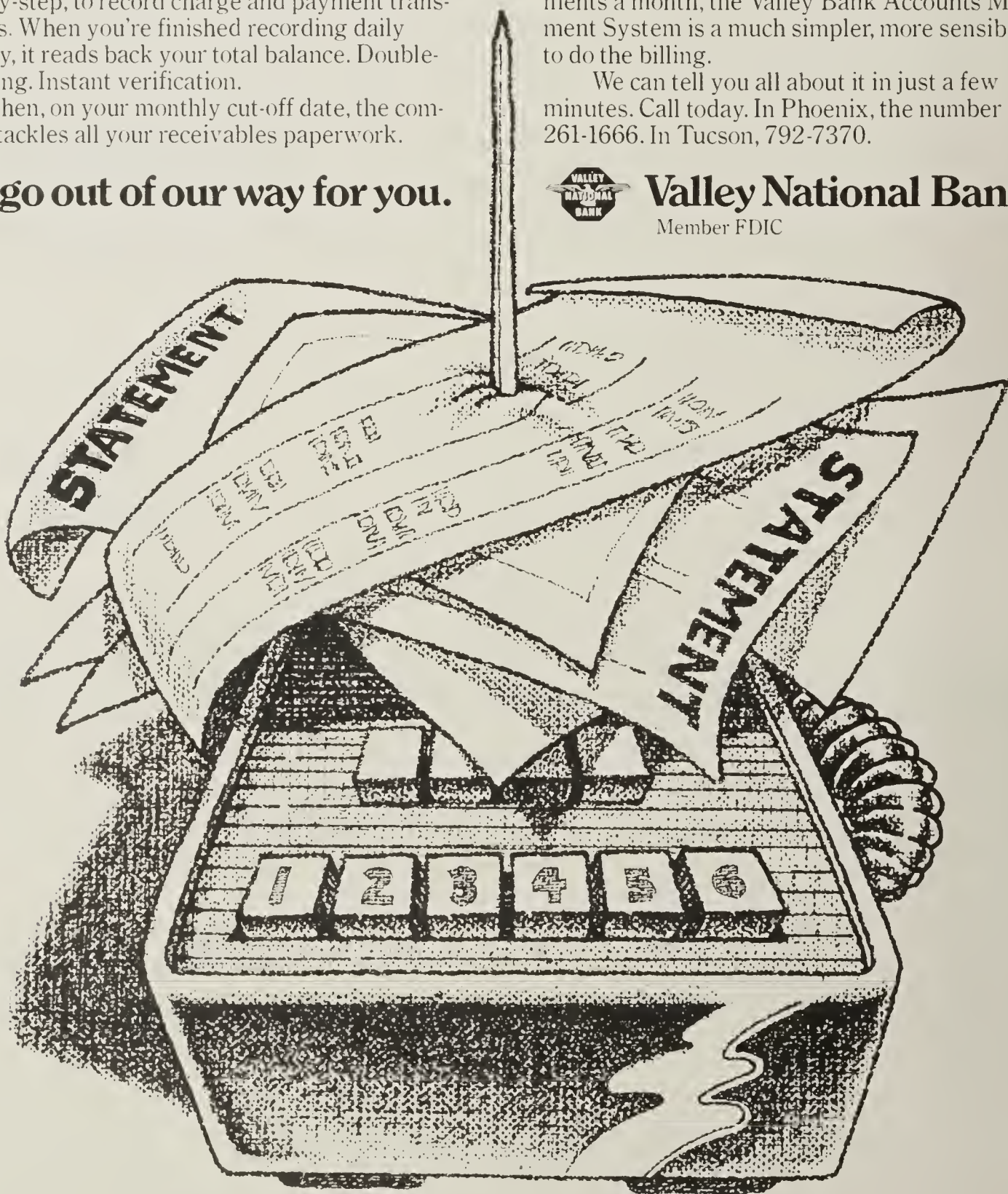
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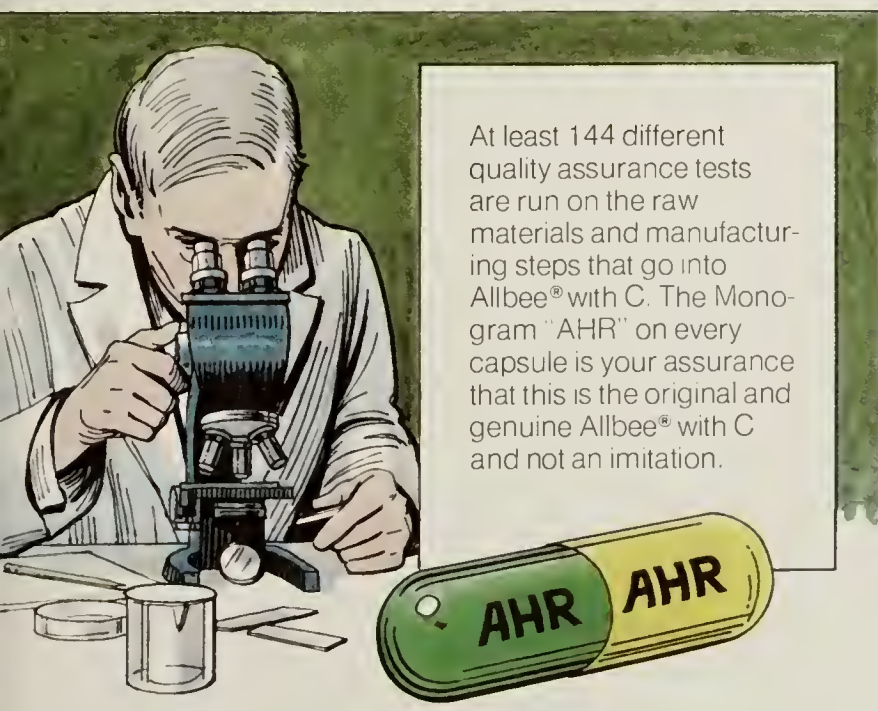
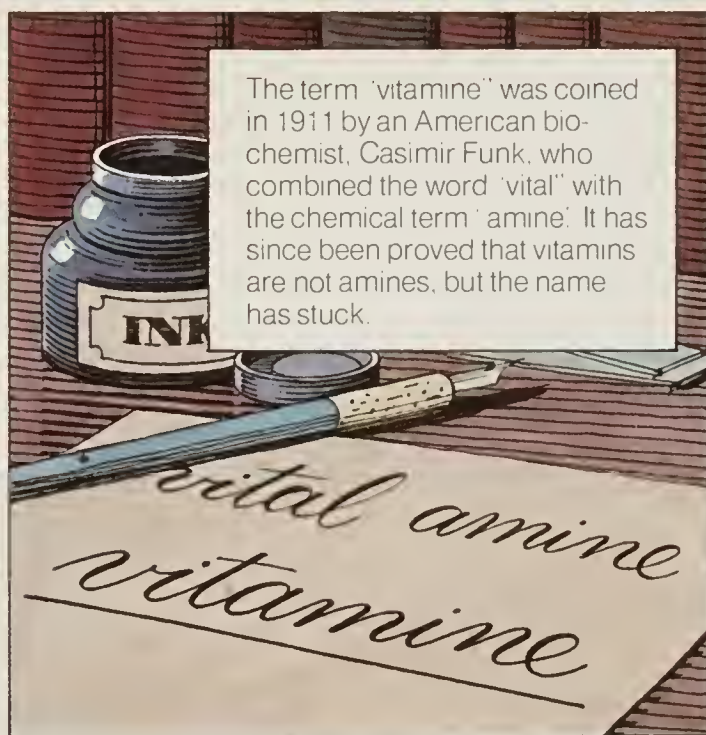
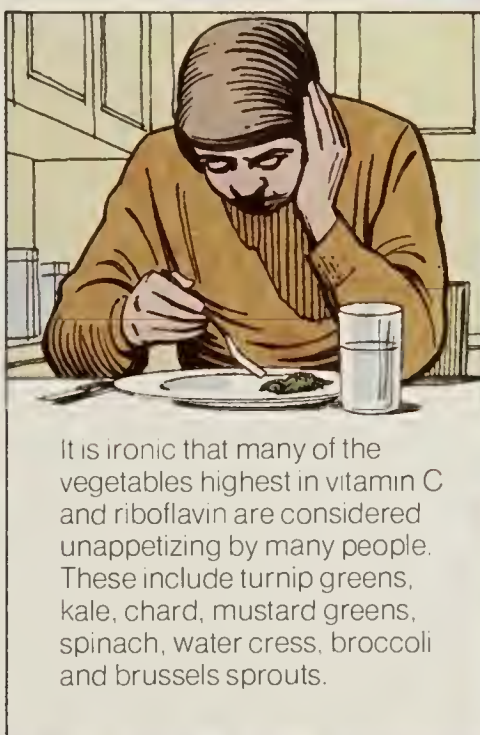
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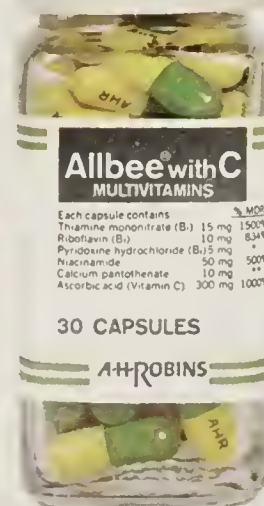
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A-H-ROBINS



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Hyoscyamine sulfate	0.1037 mg	0.1037 mg
Atropine sulfate	0.0194 mg	0.0194 mg
Hyoscine hydrobromide	0.0065 mg	0.0065 mg

Indications: Based on a review of this drug by the NAS/NRC and/or other information, FDA has classified the following indications as possibly effective: adjunctive therapy in the treatment of peptic ulcer; the treatment of the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis. Final classification of the less-than-effective indications requires further investigation.

Brief summary. Contraindicated in patients with glaucoma, renal or hepatic disease, obstructive uropathy (for example, bladder neck obstruction due to prostatic hypertrophy) or a hypersensitivity to any of the ingredients. Blurred vision, dry mouth, difficult urination, and flushing or dryness of the skin may occur at higher dosage levels, rarely at the usual dosage.

A-H-ROBINS A H Robins Company Richmond Virginia 23220

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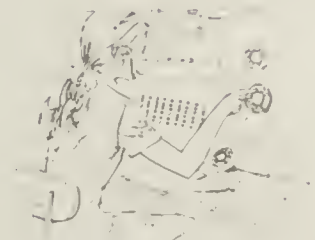
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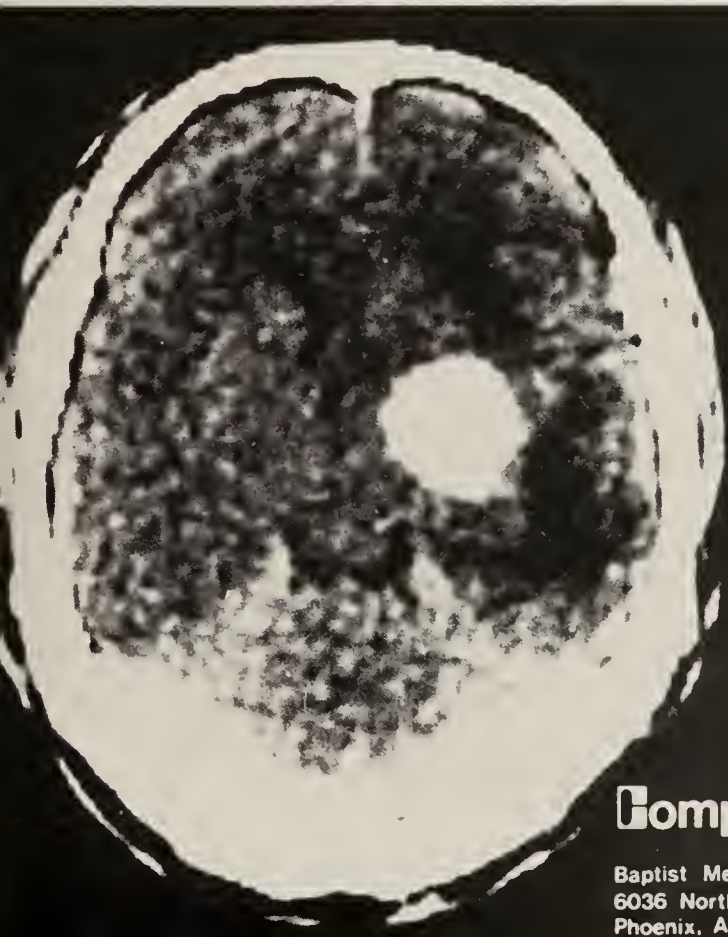


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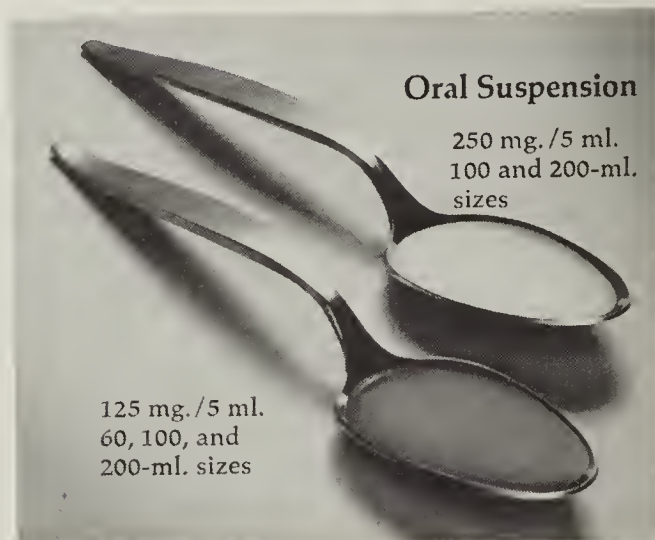
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Freeloaders, Conscientious-Objectors or Whatever



John F. Kahle, M.D.

According to Dr. James Sammons, Executive Vice President of the American Medical Association, \$70 of your 250 yearly dues to the AMA goes to support activities that are for the benefit of the patients of non-AMA physicians. This is simple enough to understand because of the AMA's statement of purpose: "To promote the science and art of medicine and the betterment of the public health." Obviously these benefits accrue to everyone, and not just to the patients of AMA members. Quite plainly, part of our money is being spent to carry the non-members who are reaping the same profits that we are without the attendant costs.

Why does such a condition as this exist? It would seem that the entire physician population would want to assume their share of the financial burden; but we all know this isn't consistent with the facts of life. Perhaps it might be worthwhile to categorize some of our cohorts who haven't joined the group.

Let's face it; first of all, there are some true "Freeloaders" in our midst. These are the guys who often tend to hide behind the facade of somehow being superior because they are smart enough to get by without paying. Perhaps a little education and a lot of peer-pressure might change their minds.

The next group might be called the



A Valedictory

**John W. Kennedy, A., B.S., M.A.,
M.D., F.A.C.R.**

In this second annual issue, the Dean and faculty of the College of Medicine, in the Old Pueblo, have provided a delectable array of original scientific articles.

By the time this issue flits across your desk, you will have selected a new and talented Editor. I trust he will receive the same generous support and constructive criticism, which you, the membership have tendered to me.

It would indeed be remiss not to acknowledge the assistance of the managing editor and his loyal staff.

Innovations have been undertaken, all derived from the guidance of the ed-

"Conscientious-Objectors." This is the individual that always maintains that the AMA doesn't represent him. Perhaps they should be reminded that they'd better get their own private act together to take before Mr. Carter and Mr. Califano when they decide to protest further bureaucratic intrusion into their professional lives.

Then there's the "Penny-wise and Pound-foolish" group that can't justify this cost while they cruise around in their Cadillacs or Mercedes. Perhaps we should remind them that the AMA pushed through the Keogh Act which saves them many times the annual dues in tax savings each year.

Next we might consider the modern day "Rip-Van-Winkles" or the "Head-in-the-Sand" group. Either they have been napping these past few years or have been too frustrated to fight. At any rate, they have effectively buried their heads in the sand hoping all will get better on its own. As their exposed plumage gets plucked out a feather at a time the resultant pain in the posterior will ultimately bring them back into the fold!

There is another group that we might call the "Uninvited Guests." Some of these are perhaps the newer-comers who really haven't been recruited by our component county societies. Many of them may be just waiting in the wings for a cue from us.



itorial board and Publishing committee. I salute you. Errors in content or judgment are mine alone.

Gathering up the reins to head the mules for the desert corral, I am reminded of a P. G. Woodhouse admonition, "All these editor blokes, I understand, get pretty careworn after they've been on the job awhile!"

In Arizona there are approximately 3300 physicians in practice, of which somewhat over 2600 are ARMA and AMA members. This leaves a group of about 700, many of whom are potential members. Some of them may have very good reasons for not desiring membership. As time goes by and as the government interferes more and more in our practices, this group should decrease. Some of the 700 are in the Armed Services. They still should be offered Service memberships. Many of the 700 are in training. They should be recruited into the House-Staff Section along with their juniors into the Student Section. Some are in the academic field. They, too, should be invited to join in order to bring them into closer liason with the practising community. Some are in salaried positions; and they, too, need to have contact with their peers.

Before we can write off any one of our prospective 700 new members as a "Freeloader," "Conscientious-Objector," or "Whatever"; we have the responsibility of seeing to it first that he has actually been actively solicited for membership. If each of our 2600 active members solicited only one-fourth of a physician, we'd have that 700 invited. Why don't you try a little recruiting effort the next time you have the opportunity to visit with a non-member in the hospital corridor or some other appropriate place?

Introduction

I am pleased that the Editorial Board of *Arizona Medicine* and its editor, Dr. John Kennedy, have invited the faculty of the University of Arizona College of Medicine to once again assume responsibility for a special College of Medicine issue of the Journal.

The Publishing Committee and the Editorial Board were faced with some difficult decisions following the 1976 House of Delegates meeting. The future of *Arizona Medicine* was determined following a membership opinion survey, a critical review of costs, and important changes in editorial policy. These were aimed at reducing expenses and improving the quality of the Journal and

its membership appeal. We at the College of Medicine are gratified that *Arizona Medicine* has survived, that its vital signs are stable, and the prognosis is good.

My thanks are due to Dr. Vanselow for his editorial and to the authors whose articles appear in this issue. Special thanks to Dr. John Kennedy, the Editorial Board, and the Publishing Committee for inviting the faculty of the College of Medicine to sponsor this issue of *Arizona Medicine*.

George D. Comerchi, M.D.
Associate Dean, Continuing Medical
Education and Outreach
Associate Professor of the
Department of Pediatrics and the
Department of Family and
Community Medicine

In response to the above trend, a number of requirements have been imposed on the physician in practice. In many states, including Arizona, he is required to participate in continuing medical education as a condition of medical society membership and/or relicensure. In some fields he periodically must submit to a written examination to renew his certification as a specialist. His care of patients is subject to review by a Professional Standard Review Organization mandated by the federal government and accreditation of the hospital in which he works is in part dependent upon maintenance of peer review and continuing medical education standards established by the Joint Commission on Accreditation of Hospitals.

It would be not only naive but probably also indefensible to argue that the trend of the past ten years do not represent a step forward. While we all recognize that the vast majority of physicians have been conscientious in their efforts to maintain professional competence, each of us is certainly aware of some instances in which this is not the case. On the other hand, acceptance of the premise that some external control of physician competence is beneficial to both the profession and the public does not require blanket endorsement of everything that has been done in the recent past to implement this concept. In the limited space available here, I would like to express my own view of just one aspect of this new philosophy regarding external control of competence—the requirement that we *participate* in continuing medical education as a condition of licensure or society membership.

Not long ago I was invited to attend an alumni reunion at one of the institutions in which I took some of my hospital officer training. The reunion was enjoyable. It provided an opportunity both to reminisce about the "good old days" and to learn something about the new programs which the hospital had or was planning to institute. To my amazement in spite of the fact that the program was almost totally devoid of scientific content, I found that I would be permitted to receive a substantial number of hours of Category I A.M.A. credit for attending it. This credit could be used both to meet ArMA continuing medical education requirements for membership and, more importantly, reregistration requirements in at least one of the states in which I currently hold a medical license.

This experience vividly illustrated

medicine was a license for life. Similarly, specialty board certification was given for life. A practicing physician might choose to read medical journals and attend educational meetings and conferences regularly but, if he did not, there were few if any external pressures which forced him to do so. He might regularly consult with his colleagues but, again, if he chose not to, no external group would tell him he must.

It would be an understatement simply to say that the philosophy regarding physician competence has changed in the last decade, for the change has been both dramatic and far-reaching. It is now accepted that evaluation and maintenance of each physician's competence is a matter of major concern both to the profession and to the public. The reasons for this change are probably twofold: on the one hand the public has become better informed and is no longer willing to accept that mere possession of an M.D. degree is a guarantee of competence; on the other, the profession has recognized that the rapid accumulation of new biomedical knowledge pertinent to the practice of medicine requires a more formal mechanism for assessing and maintaining the competence of its members than has existed in the past. The impetus for change has been further enhanced by the involvement of governmental and non-governmental third party payors who are financing an ever increasing fraction of health care costs and are demanding proof of competence as a condition of reimbursement.



Dean's Page

Continuing Medical Education and Physician Competence

Neal A. Vanselow, M.D.

I am most appreciative of the opportunity to join other faculty members of the College of Medicine as a contributor to this special issue of *Arizona Medicine*. The issue represents a fine example of a collaborative effort between a medical school and a state medical society to provide practicing physicians with current information on a variety of medical problems. Inasmuch as it is one component of a much broader effort in the field of continuing medical education (CME), it seems appropriate to reflect on where CME is going and the extent to which recently enacted CME requirements can be expected to result in improved physician competence.

For many years in the United States, the degree to which a physician maintained his competence after entering practice was left largely to his own conscience. Short of the commission of a felony or some other catastrophic error of equal proportion, a license to practice

of the problems with the "brownie" or "credit hour" approach to physician competence which is becoming widespread today and which is being incorporated into legislation in this and many other states. Credit is often given for attendance at meetings whose content bears little relationship to competence in the practice of medicine. Furthermore, the reward is given for registration at the meeting, and little or no effort is made to determine if a registrant actually attended the program, if he was awake or asleep during the sessions, or if the material presented had any relevance to his practice.

I wish I could satisfy myself that more careful monitoring of these details would solve the problems of this approach but I have an even more fundamental set of concerns. Mere attendance at an educational program does not assure that a physician-student will learn anything. Even if something is learned, there is no assurance that it will result in a physician who is more competent at the bedside. Recent studies of physician performance, using the critical decision technique, have demonstrated that most of us knew all along—that the passive possession of knowledge, such as that we obtain at most CME programs, is not the only ingredient of competence.¹¹ In addition, competence requires an understanding of the knowledge we possess and the ability to creatively integrate and apply it to problem solving and decision making. It also involves noncognitive components such as interpersonal and communication skills, attitudes, and personal attributes such as ethics and a sense of responsibility.

The concerns I have registered should not be interpreted as suggesting that I do not believe in CME, for I am convinced that journal reading and participation in post graduate courses and scientific programs is important. The point I am trying to make is that mere participation in CME cannot be equated with physician competence, and that we should not try to determine the latter by measuring the former. Competence in patient care is what both the profession and the public are interested in, but there we can measure it with any accuracy, a great deal of research must be done. Until it is, we should avoid taking "solutions which tend to lock oversimplified solutions" into legislative concrete.

Research and development to meet trends in licensure and certification *The National Board Examiner* 24:1-3 (October) 1976



Original Articles

Prospectus for Health

Anthony Vuturo, M.D., M.P.H.

As we care for patients on a daily basis and are aware of the technological advances of medicine, a steady perceptive evolution of broad based preventive medicine activities is occurring within the communities we live. Our clinical practice focuses on primary passive levels of prevention. Emphasis is on immunizations, pap smears, periodic examination, and components of multiphasic screening. These activities generally require little, if any, change or commitment on the part of our patients to be an active participant in his health maintenance. Health promotion and patient education are usually relegated to the pamphlets in our waiting room or a summary "check sheet" to encourage compliance in a therapeutic regimen.

Within nonmedical publications we read that emphasis on prevention is being stressed from the highest levels of government and industry. The President's Council of Economic Advisors concluded "Studies suggest that any additional expenditures on medical care may be a very costly way of obtaining small improvements in measured health status . . . more important may be the effect of life style and environment."¹² Walter McNerney, President of Blue Cross Association has suggested that other directions should be taken to curb the high cost of health care. The

focus should be on prevention including "teaching the children what to eat and how to watch their weight." There should be "more systematic and selective screening programs for high frequency conditions such as high blood pressure."¹³

At the community level one sees increased activity on health promotion. One general category currently being emphasized is the practice of holistic health. Practitioners of the principles of holistic health are active in exploring the relationships between body, mind, spirit and the social context under which behavior occurs. Proponents of holistic medicine place the emphasis and responsibility for the maintenance of health on the individual through active self-care. Holistic health centers, organic foods, diets, centers that teach the self-induction of the relaxation response by meditation, programs to control symptomatology through biofeedback, jogging clubs, group weight reduction and end-smoking clinics may all be considered variants in the direction of holistic health. It was recently reported in the *Wall Street Journal* that "the next major advance in the health of the American people will result only from what the individual is willing to do for himself."¹⁴

Within the last five years we have seen the development of a unique concept that possesses the potential that the primary care physician will be able to significantly expand his practice of pre-

From Department of Family and Community Medicine, Arizona Health Sciences Center, Tucson, AZ 85724

vention within the office milieu. Health Hazard Appraisal (HHA) developed by Drs. Robbins and Hall offers a method to assist the patient in becoming responsible for his health.⁴ The unique feature of the HHA is that it provides a useful motivational tool that will assist the patient in making significant changes in behavior toward reducing the risk of possible premature death. The Appraisal helps assess the risk of disease (mortality) over an ensuing ten year period in the patient's life. Risks are converted statistically to "appraisal" age and "compliance" age. A patient with a chronological age of 45 may by virtue of his present life style be appraised at being 51 years of age. The appraisal age is the key motivational factor capitalizing on the youth orientation of our society. With careful patient education and identification of risks, it is possible by actuarial methods to show that an appraisal age for example of 51 may be reduced to a "compliance" age at or below the patient's chronological age. The key motivational factor for the patient, therefore, becomes a marked personal incentive to reduce identified risk so that he may improve his chances of survival.⁵

Progress in Health Hazard Appraisal has been significant. Numerous groups have computerized the statistical assessment so that a patient is able to complete a brief questionnaire in about twenty minutes and when coupled with measurements of height, weight, blood pressure, serum cholesterol, triglycerides and blood sugar, a complete assessment can be computed and returned to the practicing physician usually within three days. The display of the patient's risk, with the appraisal and compliance ages, form the basis for patient education and health promotion.

At the University of Arizona, Project Well-Aware has been performing Health Hazard Appraisals on population groups throughout the state. The Health Hazard Appraisal is followed by health education and health promotion geared to the reduction of the individual participant's risk factors.

Costs for a completed assessment, along with health profiles and patient centered instructional material are readily available from the following sources: Interhealth/Integrated Health Services, 2970 Fifth Ave., San Diego, California 92102 or from Health Care Services Incorporated of Indiana, P.O. Box 7025, Indianapolis, Indiana 46207.

Studies are now being done to assess the impact of HHA on changing behavior in promoting health.^{6,7} Investigations by LaDou, reporting from the Ames Health Unit of NASA Ames Research Center in California, and Milsum from the Family Practice Teaching Service at the University of British Columbia, demonstrate that risk age can be significantly reduced and that patient acceptability is uniformly positive. Significant life style changes have occurred after one year follow-up.

While ideally health hazard appraisal would be the recommendation for all members of your practice, it can be applied selectively. It readily complements the "executive" physical examination as a dimension of care for a person already motivated and possessing a vested interest in maintaining his health in the optimum state. HHA has a place in the care of the "worried well." One can document objective areas for the individual self-care and redirect the patient's outlook to health promotion. Patients who appear to have high risk factors in their past medical history can benefit from a display of projected risks. Where parents of a family are at increased risk, it is possible to apply the health hazard appraisal technique even to the young adults and children within that family in order to attempt to change the entire family life style.

One can synthesize the major actuarial threats to health into a prescription for health promotion for your patient and his family. Prescriptions for health are written in many forms. Milsum has prescribed

R_x "Exercise, be of good weight, buckle up, drink little alcohol and don't smoke."⁶

Dr. Breslow, of the University of California School of Public Health, has prescribed:

- R_x 1) seven to eight hours of sleep,
- 2) eat breakfast almost always,
- 3) never eat between meals,
- 4) take part in physical exercise,
- 5) no more than four drinks at any one time,
- 6) stop smoking,
- 7) maintain optimal weight: for men (—) 5 per cent to (+) 20 per cent over "desirable" and for women not more than 10 per cent over desirable.⁸


Finally, rephrased in a slightly different manner, the Minister of National Health and Welfare for Canada, has recommended for the Canadians:

- 1) it is better to be slim than fat,
- 2) the excessive use of medication to be avoided,
- 3) it is better not to smoke cigarettes,
- 4) exercise and fitness are better than sedentary living,
- 5) alcohol is a danger to health particularly when driving a car,
- 6) mood modifying drugs are a danger to health unless controlled by a physician,
- 7) tranquility is better than excess stress,
- 8) the less polluted the air is, the healthier it is,
- 9) the less polluted the water is, the healthier it is.⁹

In conclusion, one observes increased emphasis and interest in preventive medicine in our communities. A renewed focus in what the individual can do for himself to maintain harmony of body, mind and spirit with the environment, is the thrust. Self-care following health promotion and education is a new banner on the horizon. Health Hazard Appraisal provides a useful addition to the preventive armamentarium of the primary care physician. This technique identifies and displays for the patient quantitatively the effect of life style on health and what he or she can do to maximize their chance for survival. While epidemiologists study the sensitivity, specificity, cost effectiveness and value of selected preventive techniques and provide updated information on specific risks, physicians can today recommend with confidence the above prescriptions for health promotion.

REFERENCES

1. Brett, T.B.: Prevention or Cure? "Behind the Shift in Health Care." *U.S. News & World Report*, April 4, 1977.
2. McEnerney, W.S.: "Needed: A New Direction for Our Medical System." *U.S. News World Report*, March 28, 1977.
3. Winstrom, M.: "Preventive Medicine, —The Real Challenge to Family Practice." *American Academy of Family Physician Reporter*, March 1977.
4. Robbins, L.C., Hall, J.H.: *How to Practice Preventive Medicine*, 1970.
5. Clendenin, J.G., Cowan, S., Emory, M. & Hall, T.: How Four Practitioners are Using Health Hazard Appraisal in Patient Counseling. *Western Journal of Medicine*, 122:177-180, 1975.
6. Milsum, S.H., Laszlo A., Prince, P.R.: "A Pilot Evaluation of Introducing Health Hazard Appraisal in a Community Health Center Environment: Division of Health Systems, Health Science Center, University of British Columbia, Oct. 1976.
7. Belloc, B. & Breslow, L.: "Relationship of Physical Health Status and Health Practices." *Preventive Medicine*, 1:409-421, 1972.
8. Lalonde, M.: *A New Perspective on Health of the Canadians*. Ministry of National Health & Welfare, Canada, 1973.



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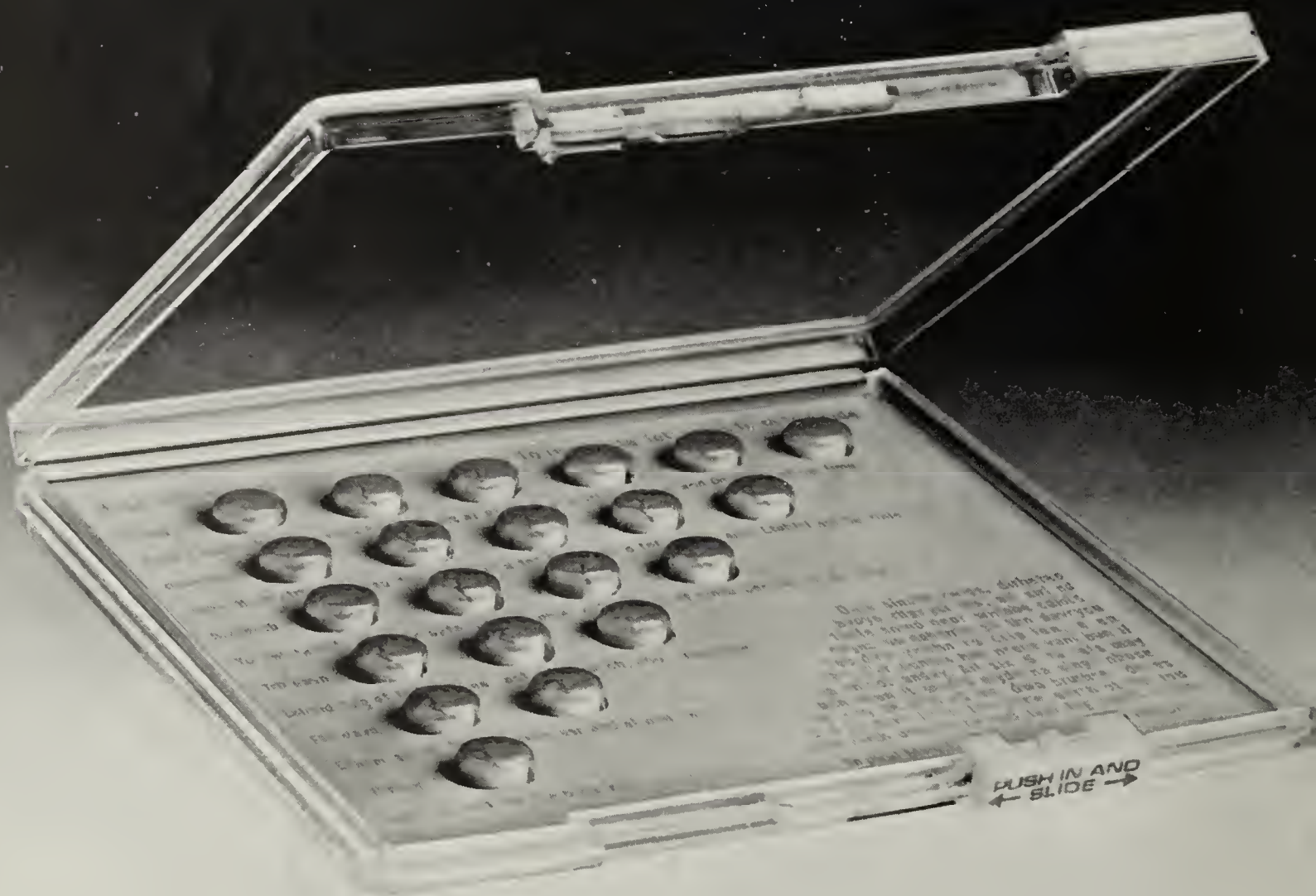
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Emotional Problems of Physicians:

Nature and Extent of Problems

Stephen C. Scheiber, M.D.

ABSTRACT

The principal emotional problems of physicians that have been identified are alcoholism, drug addiction, depression and suicide, and bad marriages. Physician colleagues frequently fail to respond when they see a sick physician in distress, or when family members call on them for help. The key signs and symptoms of emotional problems are a chaotic professional life. The true incidence of emotional problems of physicians is unknown. Current sources of data lead to the conclusion that a much larger problem exists than is presently known.

INTRODUCTION

The emotional problems of physicians have not been well studied, have been concealed and underreported, and have been poorly understood. The available studies reveal the major problems are alcoholism and drug addiction, depression and suicide, and bad marriages. The studies available rely on inpatient psychiatric admissions, psychiatric office practices, obituaries printed in the Journal of the American Medical Association, disciplinary actions of State Boards of Medical Examiners, studies of medical student populations, and one prospective study. All studies suffer from the fallacies inherent in small samples, from attempts to generalize from limited data, and in most cases from poor controls.

From: Department of Psychiatry, Arizona Health Sciences Center, The University of Arizona, Tucson, Arizona 85724. (Dr. Scheiber, Associate Professor) Presented to the Department of Neurology Grand Rounds at the Veteran's Administration Hospital, Tucson, Arizona on March 11, 1977

Methodological Problems

The reasons for the lack of data are many. The study of emotionally disturbed physicians is a painful topic. a'Brook, et al, point out that the physician patient tends to deny patienthood.⁽¹⁾ He hides emotional syndromes from peers, family and himself.^(2,3) For the physician to admit emotional problems raises the threat of economic loss. In cases where competency to practice as a physician is an issue or where addiction and self prescriptions are known, then legal sanctions to limit or discontinue practice are viewed as a threat. Modlin points out that the emotional signs and symptoms are subtle and often insidious.⁽⁴⁾ They include the "secret drink, the surreptitious pill, and the private thought of suicide." There is frequently a conspiracy of silence between the physician patient and his family and his colleagues. The prepotent reason for concealing his problem is likely the "threat to the physician patient's self-concept, self-image, and self-esteem."

For his physician colleague, the physician patient goes unrecognized or unreported for a variety of reasons or rationalizations. Colleagues frequently believe the myth, however false, that physician patients ought to be able to take care of themselves. Hence, they do not make any overtures to help or to respond to the physician patient's family's pleas for help. To report physician patients as emotionally ill may be seen as an act of betrayal and contributing to a suffering colleague's economic and legal difficulties. The lack of recognition of a physician patient's distress is related to the colleague's conscious or unconscious denial that a physician can be emotionally disturbed and is likely related to the personal threat to his col-

league of "There but for the grace of God go I"

Emotional Problems of Physicians

In spite of reporting difficulties, figures are available to suggest which are the leading emotional problems of physicians. Based on studies of disciplinary actions against physicians of three State Boards of Medical Examiners, the identified impairments include alcoholism, 2.3-3.2% of registered physicians; drug dependence, 0.9-2.0%; and other mental disorders, 0.9-1.3%.⁽⁵⁾ It is obvious that these figures are gross underestimates of these problems since Medical Examining Boards would become involved in only the most serious problems with the most overt behavioral deviations. The American Medical Association estimated that 7 to 8 percent of doctors are now or will become alcoholics. Currently there are an estimated 10,000 alcoholic physicians.⁽⁶⁾

Suicide rates derived from data presented in the Journal of the American Medical Association point to greater than one hundred suicides a year or the equivalent of the size of an average graduating class of medical students.⁽⁷⁾ Again these figures underrepresent the true rates since they are dependent on other sources reporting the causes of death. Blachley, et al., studied these statistics and found out that there were more deaths by suicide than by other violent means.⁽⁷⁾ It is well known that many coroners will conceal suicides by physicians by reporting only the presumed final pathophysiological pathway, e.g., cardiac arrest or pulmonary failure. Rose and Rosow completed a careful computerized study in California of over 200,000 deaths which demonstrated that physicians and health care workers are twice as suicide prone as the general population.⁽⁸⁾

Vaillant's studies reveal that 47% of physicians had bad marriages compared with 32% of the control sample.⁽⁹⁾ Evans studied 50 wives of physicians, most of whom were hospitalized for depression.⁽¹⁰⁾ Eighty-two percent reported unsatisfactory sexual relationships. The absent husband was a prepotent precipitating factor in the depression of these wives.

Emotional Problems - Addiction

Over 4,000 physicians in the United States or 1.5% of practicing doctors are known addicts. Estimates range from 30-100 times the rate of the general population.⁽¹¹⁾ Fifteen percent of known addicts are physicians; 15% are regis-

tered nurses and pharmacists. In one inpatient study 27% were admitted for drug addiction, 30% for alcoholism and 43% for other psychiatric disorders.⁽¹²⁾ Another study revealed 43 of 93 psychiatric admissions of physicians were for drug or alcohol addiction problems.⁽¹³⁾ Unlike other addicts the average age of onset is 40. Sedatives, tranquilizers, and stimulants are more commonly abused agents than narcotics.

Modlin and Montes' studies have shown that the common rationalizations for drug abuse are overwork, fatigue, and physical illness.⁽¹¹⁾ However, they demonstrated that the key factors are the predisposing personality of the physician and the easy availability of drugs.

The complaints of overwork are often related to an inability to say "No." "No" to patients, to referrals, to committee assignments, or to community obligations. These addiction prone physicians have no outlets for their pent up frustrations.

Fatiguability is related to the lack of satisfying marital and family relationships, lack of satisfying participation in community affairs, lack of recreation and avocations, and an underlying neurotic conflict about medical practice.

Physical illnesses include many psychosomatic ones: ulcers, asthma, hypertension, colitis, migraine headaches, and arthritis.

Modlin's studies of addicted physicians show that only 3% held their fathers in esteem, only 13% felt warmth toward their mothers, and they were sickly as children (colic, enuresis), were compliant youths and more than 50% had alcoholic fathers. Seventy-five percent have unsatisfactory sexual relations in marriage.

Nine percent of physician addicts suicide.⁽¹⁴⁾

Depression and Suicide

Pitts, et al., estimated the prevalence of affective disorders among medical students at 7.5%.⁽¹⁵⁾ Sainsbury estimates that 50% of suicides suffered from an affective disorder.⁽¹⁶⁾

The personality traits of the "good doctor" including obsessionality, lack of pleasure seeking, and feelings of indispensibility lend themselves to depression. With declining energies of middle life and subsequent inability to maintain the pace of the "good doctor," the vulnerable physician is prone to depression. Depression in physicians is a treatable illness.⁽¹⁷⁾

The studies of suicide in physicians reveal that the rate of male physicians

is 1.15% greater than the expected rate for the male population. For female physicians, the rate is three times greater than expected. In the age group over 45, there is a marked excess in expected rate. Steppacher and Mausner's study of the Journal of the American Medical Association obituaries revealed that 12 of the 40 female suicides occurred during training.⁽¹⁸⁾ In the 25-39 year age group, 26% of all physician deaths are attributed to suicide.⁽¹⁹⁾ Suicides exceed the death rates from other violent means: automobile accidents, airplane accidents, drownings, and homicides. Five percent of all physician deaths are by violent means.⁽⁷⁾ Many "accidental" deaths, such as one car accidents, solo flight airplane accidents, and drownings, are frequently suicides, but not recognized or reported as such. The most common cause of physician suicides according to Freeman is the ignoring of, or failure to recognize depression.⁽²⁰⁾ Suicide prevention is urgently needed amongst physicians.⁽²¹⁾

Bad Marriages

In Vaillant's controlled study, he documented that 47% of physicians have bad marriages.⁽⁹⁾ Modlin's studies of physician addicts points to 75% of them having difficulties with sexual relations.⁽¹¹⁾ In Evans' study of physician wives who are emotionally ill, mostly with depression, sixteen presented with drug overdoses. Nine of the sixteen were given the drugs by their physician husbands.⁽¹⁰⁾ Duffy's review of physicians' wives admitted for psychiatric hospitalizations revealed almost 1/2 of 107 studied were abusing medications. Barbiturates were the most common, but also, narcotics and stimulants were over used.⁽²²⁾ This pattern is similar to the physician addicts' pattern.

The average age of onset of depression in Evans' study of physician's wives was forty. This again, corresponds with the age when physicians become emotionally ill. If the sick physician turns to his wife for initial help and she is depressed, then she will not and, often, cannot be of help. Since her depression is often precipitated by feelings of abandonment based on being left alone by her husband in the early years of marriage, she may not only not hear her physician husband's cry for help, but may be outright rejecting.

Signs and Symptoms

Waring describes the pattern of progression of signs and symptoms of a physician in distress.⁽²⁾ The key is a chaotic

life. The distressed physician will oft start irregular office hours, be prone to poor eating and sleeping habits, and will be inefficient and disordered in his work. He becomes tense, insecure and unsuited of himself. Difficult patients with difficult problems especially aggravate his tension. He fails to request consultation with colleagues for fear of losing face. Self medication with alcohol and drugs may temporarily ameliorate his symptoms.

He may seek relief at home, only to be rejected. This, in turn, may lead to burying himself in his office with increasing office hours, and an increasing need to feel indispensable. A neglect of his practice may ensue. He lacks outside interests and recreational pursuits. With fewer assets and energy to deal with his problems, he may then try to ward off his depression by extra-marital affairs (sometimes with patients), excessive spending on luxuries, gambling on high risk stocks, or real estate (the name of investment), or plunge impulsively into youthful endeavors, such as vigorous athletic activities for which he has inadequate training and tolerance.

When these attempts fail then fatigue, tension, and depression follow. Drug abuse increases. Irritability with patients reflects the physician's feeling that all he does is give with no reciprocity on the patient's part.

Depression, drug addiction, termination of marriages, and suicide are stages in the process. Throughout, the emotionally disturbed physician fails to ask for help.

DISCUSSION

The statistics available regard emotionally ill physicians represent the tip of the iceberg. Suicide rates as reported in the Journal of the American Medical Association are underrepresented. Alcoholism and addiction rates are gleaned from disciplinary action. State Medical Examining Boards estimate by the American Medical Association. Behavioral manifestations of the problems must be so gross as to lead to a major public complaint, subsequent investigations, and then action. The more subtle, better concealed manifestations in other disturbed physicians go unchecked, unreported, and untreated. Bad marriages of physicians have been studied mostly on the basis of inpatient admissions. This same pattern, again, represents only the most severe of the existing problems.

Many of the problems are overlapping. What may start out as anxiety may lead to the use of alcohol, occasionally for relief, to depression, to barbiturate use, increasing depression, and in turn, to mixed alcohol and/or drug addiction, and suicide.

Controlled studies are needed to properly evaluate and assess the nature of the emotional problems of physicians.

ACKNOWLEDGEMENTS

The author thanks Alan I. Levenson, M.D., and Henry W. Brosin, M.D., the Department of Psychiatry, University of Arizona, for their helpful review and assistance.

REFERENCES

- a'Brook, M.F., Hailstone, J.D., McLaughlin, E.J.: Psychiatric Illness in the Medical Profession. *Br. J. Psychiatry*, 113:1013-1023, 1967.
- Waring, E.M.: Psychiatric Illness in Physicians: A Review. *Compr. Psychiatry*, 15:519-530, 1974.
- Ross, J.: The Physician as Psychiatric Patient: A Few Special Problems. *Psychiatric Digest*, 37:46, 1971.
- Modlin, H.: The Disabled Physician. *Polk County Medical Association Bulletin*, Lakeland, Florida, 1975.
- AMA Council on Mental Health: The Sick Physician: Impairment by Psychiatric Disorders. Including Alcoholism and Drug Dependence. *JAMA*, 223:684-687, 1973.
- Steindler, E.M.: The Impaired Physician. Chicago, Illinois, American Medical Association, 1975, p. 7.
- Blachley, P.H., Disher, W., Roduner, G.: Suicide by Physicians. *Bulletin of Suicidology*, NIMH, December, 1968, pp. 1-18.
- Rose, K.D., Rosow, I.: Physicians Who Kill Themselves. *Arch. Gen. Psychiatry*, 29:800-805, 1973.
- Vaillant, G.E., Sobowale, N.C., and McArthur, C.: Some Psychological Vulnerabilities of Physicians. *N. Engl. J. Med.*, 287:372-375, 1972.
- Evans, J.L.: Psychiatric Illness in the Physicians' Wife. *Am. J. Psychiatry*, 122:159-163, 1965.
- Modlin, H.C., and Montes, A.: Narcotic Addiction in Physicians. *Am. J. Psychiatry*, 121:358-365, 1964.
- Vincent, M.O., Robinson, E.A., and Latt, L.: Physicians as Patients: Private Psychiatric Hospital Experience. *Can. Med. Assoc. J.*, 100:403-412, 1969.
- Duffy, J.C., and Litin, E.M.: Psychiatric Morbidity of Physicians. *JAMA*, 189:982-992, 1964.
- Putnam, P.L., and Ellinwood, E.H.: Narcotic Addiction Among Physicians: A Two Year Followup. *Am J. Psychiatry*, 122:745-748, 1966.
- Pitts, F.N., Jr., Winokur, G., and Steward, M.A.: Psychiatric Syndromes, Anxiety Symptoms and Response to Stress in Medical Students. *Am. J. Psychiatry*, 118:333-340, 1961.
- Sainsbury, P.: Suicide and Depression, Recent Developments in Affective Disorders. Edited by A.J. Coppen, A. Walk. London, Headley Brothers, 1968, pp. 1-13.
- Bittker, T.E.: Reaching Out to the Depressed Physician. *JAMA*, 236:1713-1716, 1976.
- Steppacher, R., and Mausner, J.: Suicide in Male and Female Physicians. *JAMA*, 228:323-328, 1974.
- DeSole, D., Aaronson, S., and Singer, P.: Suicide and Role Strain Among Physicians. Presented to APA, Detroit, 1967.
- Freeman, W.: Psychiatrists Who Kill Themselves. *Am J. Psychiatry*, 124:846-847, 1967.
- Kosbab, P.: Suicide Prevention in Physicians. *New Physician*, 21:21-23, 1972.
- Duffy, J.C.: Emotional Issues in the Lives of Physicians. Springfield, Illinois, Charles C. Thomas, 1970, p. 23.

A Physician's Guide to Infant Formula Feeding

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The variety of commercial formulas available today allows greater capability for meeting the infant's special nutritional needs in various clinical situations. This report describes both the standard formulas and the special preparations available for infants with special needs.

A. FEEDING THE NORMAL INFANT

Infant formulas or human milk supply nearly all of the nutritional requirements during the first few months of infancy and continue to contribute a major portion of the nutrient needs throughout the first year of life. Therefore, it is important to know the composition of formulas so that an appropriate selection can be made.

The recommended caloric distribution for infant formulas is 7-16% protein (1.1-2.7 gm/100 ml.), 30-55% fat (2.2-4.1 gm/100 ml.), and 29-63% carbohydrate (4.8-10.5 gm/100 ml.).⁽¹⁾ The carbohydrate, protein and fat contents of all the standard milk-based formulas, all the standard soy formulas, as well as many of the special formulas fit within these ranges. Note that the protein contents of Similac Advance, whole, 2%, and skim milk are above this range. Also, the fat contents of Similac Advance, 2%, and skim milk are below this range.

The desirable caloric density of infant formulas is 20 kilocalories/fl. oz. Most of the standard formulas and many of the special formulas have this caloric density. Similac Advance, 2%, and skim milk all have caloric densities of less than 20 kilocalories/fl. oz., and are frequently prescribed to manage infantile obesity. However, obesity in infancy is probably best treated by limiting the quantity of a normal caloric-density formula, rather than offering ad lib feedings of a lower caloric-density formula which is also unbalanced relative to caloric distribution.

The iron and vitamin content of infant formulas should also be considered. Iron

deficiency anemia is one of the most common nutritional problems of infants over 6 months of age. Accordingly, the Committee on Nutrition of the American Academy of Pediatrics in 1971⁽²⁾ recommended that all infants be fed iron-fortified formulas until age one year. A more recent statement reaffirmed the need for provision of at least 1 mg of iron per kilogram per day for the first year of life.⁽³⁾ All of the standard milk-based and soy formulas, plus many of the special formulas are available fortified with iron and vitamins. Whole, 2%, and skim milk are all poor sources of iron and some vitamins. Breast milk from well-nourished mothers is a poor source of iron, but usually an adequate source of vitamins, except for vitamin D, which may need to be supplemented in the infant's diet.

Caloric distribution, caloric content, and iron and vitamin content are all important formula characteristics which should be considered when selecting a standard infant formula. The use of 2% and skim milk during the first year of life is not recommended due to their high protein contents, as well as low fat, iron, vitamin, and caloric contents. The use of whole milk should be discouraged until at least late in the first year of life because of its high protein, high solute content, and low iron and vitamin content. There is no valid indication for widespread use of Similac Advance formula.⁽¹⁾ Its low calorie, low fat, and high protein content make it an unbalanced nutritional source, similar to 2% and skim milk.

Economic factors may need to be considered when selecting an infant formula. All of the standard milk-based formulas are available in powdered, liquid concentrate, and ready-to-use forms (in order of increasing costs). The powdered form is unpopular and the ready-to-use form should be discouraged due to its excessive cost. With the exception of the soy formulas, most of the special infant formulas are more costly than milk-based formulas.

Formula will usually supply almost all of the infant's nutritional needs until age 3-6 months when solid foods may be introduced. Early introduction of solids may promote overfeeding plus impose an unnecessary feeding expense.⁽¹⁾

Recent reviews of infant nutrition are quite helpful^(1, 1, 3) relative to information on formula feeding. It should be emphasized that breast milk remains the opti-

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mal formula, and reference standard by which all other formulas are judged. It has not been supplanted in this regard by any commercial formulation. Its relative advantages and disadvantages have been well summarized elsewhere.^(6, 7)

B. THE INFANT WITH FEEDING PROBLEMS

Given the wide variety of available formulas, it is now feasible to make formula changes in an orderly, sometimes scientific fashion, when dealing with infant feeding problems. Numerous specific problems exist, requiring specialized formulas (see indications column; Table 1). This section will deal with some of the more common appropriate as well as inappropriate, clinical indications for changing formulas. The reader is referred elsewhere⁽¹⁾ for a more inclusive review of infant formula feeding in health and disease states.

1. Inappropriate indications for formula changes

Spitting up, colic, nonspecific rashes, and mild diarrhea are minor problems which frequently generate a change in formulas, often from a standard milk-base formula to a soy-base variety. While casual changes are not inherently harmful, the conclusions from such trials may be misleading. Coincidental improvement after a change may wrongly convince both parent and physician of the formula-relatedness of the problem.

a. "Spitting up."

By spitting up is meant the regurgitation, or non-forceful emesis, of small amounts of feedings. A nearly universal phenomenon, this entity is more often due to simple mechanical factors than to formula intolerance. Some of these factors might include: air swallowing due to faulty nipple holes, poor feeding technique including prop-feeding, and inadequate burping or bubbling. An important and very frequent cause of spitting up is chaliasia (or cardio-chaliasia) which permits mild to moderate gastroesophageal reflux. This is due to a physiological relaxation or incompetence of the lower esophageal sphincter and probably accounts for the regurgitation seen in nearly 40% of infants during the first week of life.⁽⁸⁾ Most cases cease to reflux after one to two weeks of age. Some persistent cases require positional or surgical therapy.

Milk allergy seldom if ever is manifested in infancy by spitting up

alone, but will be accompanied by more prominent symptoms such as large volume emeses, diarrhea, bloody stools, and perhaps eczema and respiratory symptoms. Even metabolic disorders such as galactosemia, may present with emeses and regurgitation. Furthermore, such an infant may respond favorably to a change to a non-lactose containing formula. Clearly, however, the specific diagnosis is crucial in approaching such an infant, as it may be in the infant with an allergic or mechanical problem.

b. Infantile colic (paroxysmal fussiness, nocturnal)

Like spitting up, colic is so common as to include 25-50% of normal babies.⁽⁹⁾ In that same series 87% of the infants had a recognizable fussy period each day.⁽⁹⁾ When colicky periods were actually observed 2nd recorded, 2 distinct minority of infants between the 3rd and 8th week cried less than 1½ hours daily.⁽¹⁰⁾

The colicky baby may be defined as one who cries for more than 3 hours per day on more than three days in a given week.⁽¹¹⁾ The fussiness typically increases from 3-6 weeks of age, and thereafter plateaus or diminishes with or without intervention. It seldom persists much beyond 12 weeks. Since colic is a self-resolving problem, which usually improves after 6 weeks of age, any intervention, including formula changes, will frequently coincide with improvement. Milk allergy has been suggested as being responsible for 10-15% of infantile colic,^(9, 12) but the evidence is quite unconvincing by today's standards (see under "milk allergy" section).

c. Nonspecific rashes

Urticaria and atopic eczema are possible reflections of food hypersensitivity, and should prompt consideration of milk allergy. The other types of nonspecific rashes, as well as the more common specific dermatoses such as seborrhea, should not prompt changes in formula feeding. Even in the case of early onset atopic eczema, many dermatologists dispute the causal role of milk protein. However, the weight of pediatric opinion still favors this association in early infancy.

d. Mild Diarrhea

Mild diarrhea can be defined as

fewer than six small, semiformal loose bowel movements per day associated with minimal water loss. Mild diarrhea is usually self-limited and warrants no formula change. However, certain clinical features may well indicate a change:

- (1) Persistence of mild to moderate diarrhea following an acute severe diarrheal illness (probable carbohydrate intolerance)
- (2) Association of diarrhea with other symptoms of milk allergy.
- (3) Failure to gain weight in the face of persistent diarrhea.

These problems will be discussed in the following section.

2. Appropriate Indications for Formula Changes

a. Carbohydrate Intolerance

With increasing damage to the small intestinal mucosa, the brush border enzyme systems responsible for hydrolysis of disaccharide sugars (e.g. lactose, sucrose, maltose) are increasingly impaired. With severe insults, monosaccharide transport systems may be affected such that glucose or fructose absorption is impaired. (The disaccharidases, lactase present in smallest amount; hence, the observation that lactose is the chief problem in perpetration of diarrhea by carbohydrate feeding. The net result of disaccharide or monosaccharide malabsorption is an osmotic type of diarrhea, where unabsorbed sugars pass into the feces, or are further degraded by bacterial flora into acidic end products (e.g. lactic acid, acetic acid).^(13, 14)

(1) LACTOSE INTOLERANCE

Although extremely rare in infants as a primary, congenital problem, secondary lactose intolerance (lactose malabsorption, lactase deficiency) may occur in 50-80% of infants with moderate to severe diarrhea.^(15, 13) The intolerance usually can be confirmed by simple office procedures. This involves doing a standard pH (nitrazine paper) and Clinitest determination (for reducing substances) on the liquid stool. The stool for reducing substances is tested by: adding 5 gts of fresh liquid stool (or 5 gts H₂O + pea-size amount

semi-formed stool) to 10 gtts of H₂O, then adding a Clinitest Tablet (Ames Co., Inc., Elkhart, Indiana). Readings of 0.5% (1+) or greater, indicate significant reducing substances in the stool and would strongly suggest lactose intolerance; likewise, a stool pH of less than 6.0 suggests the presence of acidic metabolic products of carbohydrate fermentation.

Alternately, should one elect not to test the stools for pH and reducing substances, a simple elimination of dietary lactose (e.g. prescribing a soy formula) followed by improvement, would suggest this problem. The important concept however, is that lactose intolerance is a temporary phenomenon in infancy, associated with a mucosal insult. It must be distinguished from cows milk protein allergy, the other major reason for cows milk or formula intolerance. The period of lactose avoidance usually need not exceed two to four weeks.

(2) SUCROSE INTOLERANCE

The patient with a severe diarrheal picture and a secondary intolerance of sucrose, will also be intolerant of lactose. Hence, some infants will have persistent diarrhea when either disaccharide is presented to them.⁽¹⁴⁾ (e.g. milk-base or soy-base formula). Sucrose malabsorption can be confirmed by office tests similar to those used for lactose. However, since sucrose is not a reducing sugar one must use 10 drops of 1. O N HC1 instead of water for the Clinitest method (for acid hydrolysis of any sucrose present), and, in addition, the mixture is brought to a boil for a few seconds before adding the Clinitest tablet. The interpretation of positive stool reducing substances and low stool pH are similar for lactose and sucrose malabsorption. For children with combined disaccharide intolerance, a monosaccharide containing preparation (e.g. Pregestimil, Vivonex, CHO-Free + Glucose) will be needed.

A primary form of sucrose intolerance, congenital sucrase-isomaltase deficiency, may exist if diarrhea appears when the infant is first exposed to solid foods (e.g. fruits) containing sucrose. Sucrose-containing formulas exacerbate this problem, whereas cows milk and other lactose-containing formulas are tolerated. Stool examination for pH and reducing substances will suggest this diagnosis, but sucrose tolerance tests or intestinal biopsy for sucrase activity will be needed as confirmation. Rigid dietary exclusion of sucrose should cause remarkable improvement in this entity.⁽¹⁶⁾

(3) MONOSACCHARIDE INTOLERANCE

Infants with severe forms of diarrheal disease, especially if associated with malnutrition, may be intolerant of monosaccharides as well as disaccharides.^(17, 18) Such infants will have watery diarrhea, even on glucose-containing formulas such as Pregestimil, but cannot be given totally carbohydrate-free feeding (e.g. CHO-Free) because hypoglycemia would ensue. Intravenous glucose plus oral CHO-Free or total intravenous nutrition should be prescribed. Re-introduction of sugars should be gradual and closely supervised.

b. The Young Infant with Protracted Diarrhea, Weight Loss, and Malnutrition

In dealing with infantile diarrhea, consideration of water balance, acid-base and electrolyte status are critical during the first few hours and days. After 3-4 days, however, nutritional intake assumes an equal or perhaps more important role. Especially in the infant under 3 months of age, it is inappropriate to give prolonged hypocaloric feedings (e.g. clear liquids) in order to decrease stooling. The young infant (under 3 month) with diarrhea of longer than 2 weeks duration, in the face of poor caloric intake, is greatly at risk for secondary serious infections, as well as the "intractable diarrhea of infancy" syn-

drome. This symptom-complex of unknown cause probably reflects the additive problems of an infectious enteritis, with superimposed malnutrition in a very vulnerable age group.⁽¹¹⁾ It is frequently fatal. Undue caloric restriction by diarrhea-oriented rather than nutrition-oriented physicians and families, may predispose to this entity. Such infants are frequently intolerant of standard milk-base and soy-base formulas, usually because of the carbohydrate or fat content. Therefore, experience with some of the monosaccharide-containing, and more "elemental" preparations is useful in providing these severely intolerant infants with adequate nutrition. Nutritional measures take priority over all other considerations including primary diagnostic testing, in these infants. Many require total parenteral nutrition.

c. Milk Allergy

For purposes of this discussion, milk allergy refers to the sensitivity to any one of the various cow milk protein fractions, but especially casein or beta lactoglobulin. Certain of the special formulas (e.g. Pregestimil, Nutramigen) have casein as their protein base, but this has been enzymatically hydrolyzed into amino acids and small peptides. These formulas, although casein-based, are the *least* allergenic and should not be confused with the whole protein, standard milk-base formulas. Where proven, allergy to cow milk protein is a clear indication for formula substitution.

However, since there is a large tendency to over diagnose this entity,⁽²⁰⁾ numerous formula changes are casually made in the name of milk allergy. The actual incidence of milk allergy is estimated by some experts to be below 1%. However, it is estimated that 10% of the infant population is on soy-based formulas,⁽¹⁾ with milk protein allergy being the leading indication.

The nonallergic child should not be labelled as allergic, and the truly milk allergic child should be clearly identified, so that milk protein can be rigidly excluded

and only cautiously reintroduced at a later date. Criteria for the diagnosis of milk allergy have been defined. The diagnosis is based on: identification of specific

symptoms; milk protein withdrawal; and recurrence of symptoms on rechallenge. The types of symptoms seen, in decreasing order of occurrence, include: diar-

rhea, vomiting, abdominal pain, eczema, rhinitis, asthma, urticaria, and anaphylaxis.⁽²¹⁾ The symptoms tend to occur in clusters (hence vomiting is usually seen

TABLE 1.
PHYSICIAN'S GUIDE TO INFANT FORMULA FEEDING

MILK-BASED FORMULAS	COST	CHO Gm/100 cc	PRO Gm/100 cc	FAT Gm/100 cc	OSM	PROBLEMS	INDICATIONS
1. Enfamil	\$.73/Qt	Lactose 7.0-7.6	Skim Milk	Vegetable Oils	300	Milk allergy	Infant without special nutritional requirements.
2. Similac	\$.70/Qt		Electrodialyzed	(Soy, corn, coconut)	427	Lactose intolerance	Infants with inability to concentrate urine or predisposed to hypocalcemia. (3&4 only)
3. Similac PM 60/40			Whey (3&4 only)		(3 only)		
4. SMA	\$.73/Qt		1.5-1.6	3.5-3.7			
5. Similac Advance	\$.52/Qt	Corn Syrup Solids Lactose 6.2	Skim Milk Soy Protein 3.6	Corn Oil 1.7	251	As above plus low fat and low caloric density.	Reduce calorie intake without reducing volume intake.
SOY FORMULAS							
1. Isomil	\$.68/Qt	Sucrose	Soy Protein	Vegetable Oils	200	Soy allergy	Milk allergy
2. Neo-Mull-Soy	\$.96/Qt	Corn Syrup	2.0-2.5	3.4-3.8	↓	Sucrose intolerance	Lactose intolerance
3. Nursoy	\$.55/Qt	Tapioca Starch		(Soy only for 2, 4, 5)	260		
4. Prosobee	\$.68/Qt	6.4-6.8					
5. Soyilac	\$.73/Qt						
VERY LIMITED USE FORMULAS							
1. Lofenalac	\$2.34/Qt	Corn Syrup Tapioca Starch 8.7	Hydrolyzed Casein Amino Acids .4	Corn Oil 2.7	457	Cost; need to monitor serum phenylalanine levels.	Phenylketonuria
2. Lonalac	\$1.00/Qt	Lactose 4.8	Casein 3.4	Coconut Oil 3.5	259	Increased renal solute load; decreased Na ⁺ content; short term use in absence of other Na ⁺ source. Need Vit supplements	Use in any circumstance is questionable.
3. Meat Base	\$1.00/can	Sucrose Tapioca Starch 4.2	Beef Hearts 2.9	Sesame Oil 3.3	147	Relative high protein and low CHO content.	Few - possibly in some allergic individuals.
MILK							
1. Human		Lactose 6.9	Casein 1.1 Lactalbumin	4.5	300	Lactose intolerance Milk allergy	Ideal formula for infants with no special nutritional requirements.
2. Whole	\$.41/Qt	Lactose 4.9	Casein 3.5 Lactalbumin	Butterfat 3.7	280	Milk allergy; increased protein content; lactose intolerance.	After age one year when formula is discontinued.
3. 2% Low Fat	\$.39/Qt	Lactose 6.0	Casein 4.2 Lactalbumin	Butterfat 2.0	300	Increased protein; decreased fat & calorie; milk allergy; lactose intolerance.	After age one year if calorie and/or fat restriction is desired.
4. Skim	\$.35/Qt	Lactose 5.1	Casein 3.6 Lactalbumin	Butterfat .1	280	As above plus markedly decreased calorie content.	After age two years if calorie and/or fat restriction is desired.

SPECIAL FORMULAS	COST	CHO Gm/100 cc	PRO Gm/100 cc	FAT Gm/100 cc	OSM	PROBLEMS	INDICATIONS
1. CHO Free	\$1.12/Qt (no sugar)	Glucose 7.2 (added)	Soy Protein 2.1	Soy Oil 3.4	500	Osmolality Cost	Disaccharidase deficiency. Milk allergy. Glucose-galactose malabsorption (with fructose added instead of glucose).
2. Ensure	\$2.24/Qt	Corn Syrup Sucrose 14.3	Casein Soy Protein 3.7	Corn Oil 3.7	460	Osmolality Cost Must be supplemented with Vit. D & Ca ⁺⁺	High calorie density (1cal/lcc) formula for infants with poor calorie intake from formula. Designed for adult tube feeding formula. Lactose intolerance.
3. Isocal	\$3.20/Qt	Corn Syrup 13.0	Casein Soy Protein 3.4	Soy Oil (80%) MCT Oil (20%) 4.1	350	Cost Must be supplemented with Vit. D & Ca ⁺⁺	High calorie density (1cal/lcc) formula for infants with poor calorie intake from formula. Designed for adult tube feeding formula. Lactose intolerance.
4. Nutramigen	\$1.64/Qt	Sucrose Tapioca Starch 8.6	Enzymatically hydrolyzed casein 2.2	Corn Oil 2.6	400	Cost. Osmolality. Acidosis and FIT reported because of high acid load of the formula. Contains a trace of lactose.	Milk allergy. Lactose intolerance. Proteolytic deficiency.
5. Pregestimil	\$1.87/Qt	Dextrose Tapioca Starch 8.8	Enzymatically hydrolyzed casein 2.2	MCT Oil Corn Oil (trace) 2.8	610	Osmolality Similar problems as with Nutramigen.	Same as Portagen plus sucrose intolerance and proteolytic deficiency. Ideal for cystic fibrosis.
6. Portagen	\$.93/Qt	Corn Syrup Sucrose 7.7	Casein 2.3	MCT Oil Corn Oil (trace) 3.3	346	Must be properly diluted. Cost.	Chylous ascites, intestinal lymphangiectasia, various steatorrheas such as cystic fibrosis, chronic liver disease, biliary atresia, biliary obstruction, sprue.
7. Vivonex (Unflavored)	\$4.16/Qt	Glucose Oligosaccharides 22.7	Amino Acids 2.0	Safflower Oil .14	582	Very low fat content. Osmolality. Electrolyte imbalance may occur. Supplementation with Ca ⁺⁺ , Fe, Vit. D, Niacin necessary. Cost.	High calorie density formula (1cal/lcc). Infants with severe malabsorption. Elemental formula designed for adult Disaccharidase deficiency. Proteolytic deficiency.
8. MCT Oil (Supplement)	\$13/Qt			Coconut Oil (fractionated) 100		Cost May cause diarrhea if used in excess.	May be added to infant formula to achieve high calorie density formula in special indication.

TABLE 2.
INFANT PRODUCTS AVAILABLE IN MEXICO*

MILK-BASED FORMULAS	DESCRIPTION	SPECIAL FORMULAS	DESCRIPTION
1. Dextrogeno Con Miel	Standard milk base formula.	1. Alacta	Half skim milk, half whole milk, with or without dextrins and maltose, high protein.
2. Enfalac	Standard milk base formula.	2. Cho-Free	Soy isolate, soy oil.
3. Lactogeno	Standard milk base formula.	3. Eledon	Fat-free milk formula acidified with <i>Lactobacillus</i> .
4. Nan	Standard milk base formula.	4. Nestrogeno	Fat-free milk formula with dextrins and maltose, sucrose.
5. Nesbrun	Standard milk base formula.	5. Olac	High protein milk formula.
6. Pelargon	Standard milk base formula.	6. Vivonex	Glucose, amino acids, safflower oil; elemental formula.
7. S-26	Standard milk base formula.		
8. SMA Maternizada	Standard milk base formula.		
SOY FORMULAS		ADDITIVES & SUPPLEMENTS	
1. Instansoy	Soy flour, fructose, dextrose, malt extract, cocoa, methionine.	1. Calsein	Calcium caseinate powder; protein additive.
2. Lactarina	Soy, wheat, corn, maize and malt flours.	2. Casec	Calcium caseinate powder; protein additive.
3. Neo-Mull-Soy	Soy isolate.	3. Lacta-Ca	Calcium caseinate powder; protein additive.
4. Risoya	Soy and corn flours, hydrolyzed protein, sucrose.	4. Nidex	Carbohydrate additive; dextrins and maltose.
5. Sobee	Soy flour, dextrins, maltose, sucrose, soy and coconut oils.	5. Pernutril	Nutritional supplemented syrup with protein, fat, CHO.
6. Sustilac	Soy flour, dextrins, maltose, fructose, vegetable oil, methionine.	6. Protevit	Nutritional supplemented powder with protein, fat, CHO; 400 cal/100 Gm.

*Compiled from Diccionario de Especialidades Farmaceuticas, 1973, 20th edition.

with diarrhea) and are not self-resolving while milk or milk-based formulas are continued. Goldman's criteria for confirming milk allergy include:⁽²¹⁾

- (1) The symptoms (same symptoms each time) occur within 48 hours after a milk challenge.
- (2) Three such positive challenges, with regard to onset, duration, and clinical features, are needed to diagnose the condition.
- (3) The symptoms subside after each challenge.

Although many clinicians would accept fewer than 3 challenges as confirmatory, the diagnosis is usually made at a reasonable level of confidence only by withdrawal and rechallenge. The exception is in that rare, truly life threatening situation (shock-like state, anaphylaxis, massive bloody stools) where challenge should either be avoided or carried out under the most controlled, hospital-based circumstances. Where milk allergy is confirmed, soy formulas are usually selected, largely because of economy. The hydrolyzed casein formulas offer an even more hypoallergenic protein, but their cost is significant. However, the truly allergic child occasionally develops both soy and milk allergies, thus necessitating the change to a hydrolyzed protein source such as Nutramigen or Pregestimil.

USE OF TABLES I & II

These tables bring together information from multiple sources.^(22, 23, 24, 25)

Not every individual formula is included, but all major groups are represented. Knowing the composition of the products allows one to make a selection appropriate to the clinical setting. Two examples are illustrative:

(1) Eliminating milk protein usually also involves eliminating lactose (e.g. a change from a milk-base to soy-base formula involves changing to sucrose as carbohydrate). However, using Portagen one could achieve an exclusion of lactose with retained milk protein (casein), so as to distinguish between protein and sugar intolerance. (2) Likewise, where a soy-base formula is poorly tolerated, one could search the table to find a formula which contained sucrose but no soy protein. The obvious choice would be Nutramigen.

Numerous very specialized formulas exist (e.g. Lofenalac for Phenylketonuria-PKU), and will not be discussed. Use of the "special formulas" listed in Table I implies a willingness to accept some of the potential problems as well as the advantages of the preparation. Osmolality is one such consideration. With preparation such as Pregestimil and Vivonex, full strength feedings must be cautiously approached because of this consideration, since osmotic diarrhea may be induced. Additionally, some of the preparations listed (Ensure, Isocal, Vivonex) are not infant formulas *per se* and must be supplemented with calcium, Vitamin D, etc. if used on a long term basis.

Estimated costs per quart are based on the concentrated liquid form where available, or the powder where it is the only available form. The prices are a composite of Tucson, Arizona, sources, December 1976.

Table II gives the current available information on formulas available in

Mexico. This may be useful for residents of Southwestern states who travel for extended periods in Mexico, or in making formula decisions relative to patients from Mexico.

D. SUMMARY

This information is intended to assist the primary care physician who renders advice on infant feeding. It emphasizes the wide range of available formulas and their applicability to various states of health, disease, and intolerance.

REFERENCES

1. Fomon, SJ: *Infant Nutrition*. Phila, W.B. Saunders, 1974, pp 359-472.
2. American Academy of Pediatrics Committee on Nutrition: Iron fortified formulas. *Pediatr* 47:786, 1971.
3. American Academy of Pediatrics Committee on Nutrition: Breast Feeding and Formulas. *Pediatr* 57:278, 1976.
4. Soy-Based Formulas for Infants, Medical Letter, 18:104, Nov. 19, 1976.
5. Neumann, C & Jelliffe, D (eds): *Nutrition in Pediatrics*. *Pediatr Clin N Am* 24:1-274, 1977.
6. Hambræus, L: Proprietary versus human breast milk in infant feeding: A critical appraisal from the nutritional point of view. *Pediatr Clin N Am* 24:17, 1977.
7. Is Breast Feeding Best for Babies. *Consumer Reports*, 42:152, 1977.
8. Gryboski, J: *Gastrointestinal Problems in the Infant*. Phila, W.B. Saunders, 1975, p 92.
9. Wessel, M, Cobb, J, Jackson, E, et al: Paroxysmal Fussing in Infancy Sometimes Called "Colic." *Pediatr* 14:421, 1954.
10. Brazelton, T: Crying in Infancy. *Pediatr* 29:579, 1962.
11. Carey, WB: Maternal Anxiety and Infantile Colic. Is There a Relationship. *Clin Pediatr* 7:590, 1968.
12. Breslow, L: A Clinical Approach to Infantile (A Review of Ninety Cases). *J Ped* 50:196, 1957.
13. Lifshitz, F, Coello-Ramirez, P, Gutierrez-Topete, G, et al: Carbohydrate Intolerance in Infants with Diarrhea. *J Ped* 79:760, 1971.
14. Lebenthal, E: Small Intestinal Disaccharidase Deficiencies. *Pediatr Clin N Am* 22:757, Nov. 1975.
15. Chandrasekaran, R, et al: Carbohydrate Intolerance in Infants with Acute Diarrhea, and its Complications. *Acta Paediatrica Scand* 64:483-488, 1975.
16. Ament, ME & Perera, DR: Sucrase-Isomaltose Deficiency—a Frequently Misdiagnosed Disease. *J Pediatr* 83:721, 1973.
17. Lifshitz, F, et al: Monosaccharide Intolerance and Hypoglycemia in Infants with Diarrhea. I Metabolic studies in 73 infants. *J Ped* 73:604, 1970.
18. Lifshitz, F, et al: Monosaccharide Intolerance

- and Hypoglycemia in Infants with Diarrhea. I. Clinical course in 23 infants. *J Ped* 77:595, 1970.
19. Roy, C, Silverman, A & Cozetto, F: *Pediatric Clinical Gastroenterology* (second ed) St. Louis: C V. Mosby Co., 1975.
20. Lebenthal, E: Cow's Milk Protein Allergy. *Ped Clin N Am* 22:827, Nov. 1975.
21. Goldman, AS, Anderson, DW, Jr., Sellere, WA et al. Milk Allergy. I Oral challenge with milk and isolated milk proteins in allergic children. *Pediatr* 32:425, 1963.
22. Lifshitz, F: Malabsorption Syndrome and Intestinal Disaccharidase Deficiencies, Gellis, S & Kagan B: *Current Pediatric Therapy*, Phila, W.B. Saunders, 6:237-247, 1973.
23. Physician's Desk Reference, Oradell, N.J.: Medical Economics Co., 31st ed, 1977.
24. Infant Formula Products. Nutrient Information. Evansville, Ind: Mead Johnson & Co., 1976.
25. *Infant Formula Products*, Evansville, Ind: Mead Johnson & Co., 1974.

Differential Diagnosis of Knee Pain in Children

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Pain in the knee is a common presenting complaint in children. Often the specific etiology for the pain cannot be determined, and the complaint is erroneously attributed to "growing pains." The purpose of this review is to present a limited differential diagnosis of knee pain in the pediatric age group, approximately up to 17 years of age. History and physical examination are generally sufficient to establish the diagnosis. More elaborate and expensive diagnostic studies should be necessary only to confirm a suspected diagnosis. Some of the conditions cited are common and others are relatively uncommon. All have caused management or diagnostic problems in the author's experience.

EVALUATION

Children under the age of six or seven are typically unable to localize or even identify pain reliably and, therefore, subjective data may not be available or useful. Limp or refusal to walk may be the chief manifestation of pain. It is helpful to establish a relationship between the pain and pre-existing trauma, specific activity, time of day, or overuse of the part. Documentation of the patient's growth pattern is indicated in

order to ascertain whether the onset of the pain is correlated with accelerated growth. A family history of pain syndromes should be sought. It is essential to determine whether there is some secondary gain involved within the patient's family or social setting with respect to the knee pain.

The techniques of physical examination of the knee are covered in numerous standard physical diagnosis texts.⁵ Several features of the examination frequently overlooked will be emphasized here. It is good practice to carry out an "abdominal" examination of the knee. In classical physical diagnosis of the abdomen it is taught to palpate the abdomen carefully for the tip of the spleen, edge of the liver, pole of the kidney, and other specific underlying anatomical structures. A similar principle should be applied to examination of the knee and other joints precisely localizing tendons, muscles, bursae, ligaments, growth plates, bony landmarks, overlying nerves and vessels, and meniscal cartilages. Brief observation of the lower extremities in stance and in gait both with respect to alignment and dynamic function is extremely valuable.

A critical and commonly forgotten portion of the examination to record quantitatively is the range of motion of the knee. Loss of range of motion is a very sensitive indicator of objective pathology. Quadriceps atrophy similarly is an invaluable objective criteria of knee pathology. Lastly, the Brittain test for chondromalacia patellae is performed by asking the patient to tense his quadriceps mechanism while the knee is fully extended. The upper pole of the patella is gently depressed with the examiner's index finger while the patient performs this maneuver. Accentuation of pain is a positive test suggestive of chondromalacia patellae. Examination under anesthesia to subtract the influence of pain and guarding should be considered an extension of the physical examination.

A complete radiographic study of the pediatric knee should include an anteroposterior view, a lateral view with the knee fully extended, a tangential ("sunrise") view of the patella, an intercondylar notch view, and comparison views of the opposite knee. The intercondylar notch view reveals areas of the joint space and the femoral condyles which are not visible on a standard anteroposterior view. Similarly, the fully extended lateral view of the knee allows

accurate assessment of the relationship of the patella to the intercondylar notch as in the case of patella alta. Arthrography of the knee can be extremely helpful in confirming suspected diagnoses or as a preoperative study to differentiate forms of internal derangement.

Arthroscopy of the knee is proving to be increasingly useful as a means of directly observing the pathological alterations within the knee joint. Although low morbidity procedures, both arthrography and arthroscopy are invasive techniques of examination with attendant risks.

SPECIFIC SYNDROMES

Growing Pains. "Growing pains" is a specific diagnosis and not, as often used, a diagnosis of exclusion or frustration. It is thought to be a form of myalgia and is a deep, intermittent, poorly localized, non-articular pain. It is not associated with tenderness. The pain is not related to activity; it occurs late in the day or in the evening and is generally decreased or gone by morning.⁷

Conversion Symptoms. Conversion symptom is not a diagnosis of exclusion but a diagnosis with specific criteria. A sensitive history is essential in this context. Pain in this setting helps the patient, usually an adolescent, cope with his environment by effectively reducing his anxiety level. Often there is a parental or other familial model for the specific symptom with the use of health issues and symptoms in the family communication. Patients typically show an inappropriate lack of concern about the symptoms.^{4,8}

Juvenile Rheumatoid Arthritis. Juvenile rheumatoid arthritis may typically involve a few or only one joint. Diagnosis is difficult and criteria have been covered in detail elsewhere.² The children may not complain of pain but limp will be reported by the parents, and physical examination will disclose loss of range of motion and stiffness of the knee. Suspicion of this diagnosis is critical not only for initiating appropriate treatment for the arthritis but for preventing the flexion contracture and posterior subluxation deformities of the knee which are extremely difficult to treat in their established state.²

Popliteal Cyst. This is a form of bursitis. Although the condition can occur as an isolated entity, it may be associated with pathology within the knee joint itself. The presence of such a lesion should lead to diagnostic evaluation for an intra-articular cause. The

ists are generally best observed with the patient's knee fully extended and in prone position. Occasionally arthrography will both define other pathology within the knee joint and demonstrate communication of the cyst with the knee joint.

Internal Derangement. These may include a tear of the meniscus or a tear of the cruciates. Physical findings of locking, loss of range of motion, positive drawer sign, click, and ligamentous instability are identical to those in the adult. The important aspect of this diagnosis is the recognition that internal derangements do occur in children.¹⁰

Discoid Meniscus. This congenital anomaly of the knee probably is asymptomatic until cystic degeneration or a tear occurs in the discoid meniscus, though it has been cited as a cause of locking in the young. The physical findings are identical to those of a tear of the meniscus but the patient may not have a history of significant trauma. Physical examination may show locking, positive McMurray click, or joint line tenderness. Arthrographic findings are typical.¹¹

Quadriceps Malalignment Syndromes. The resultant line of pull of the quadriceps mechanism should fall along a line connecting the midpoint of the tibial tubercle, the midpoint of the patella, and the anterior inferior iliac spine. Patients who have genu valgus, internal tibial torsion, or lateral placement of the tibial tubercle may have lateral displacement of the patella on contraction of the quadriceps mechanism. Patients should be observed with their knees in full extension and asked to contract their quadriceps actively. Observation that the patella deviates laterally is a suggestive finding that a quadriceps malalignment syndrome can be a cause of their knee pain. Malalignment results in chondromalacia patellae most commonly.¹¹

Patella Alta. The small, high-riding patella of this syndrome does not guide within the patellar notch. These patients are subject to subluxation of their patella and development of chondromalacia patellae. The lateral radiograph taken with the knee in full extension will generally demonstrate this well. Physical examination shows a palpably small patella.

Subluxating or Dislocating Patella. These patients refer to their knee repeatedly "going out" or "jumping out of

place." The patella snaps over the lateral femoral condyle. The dislocated patella is obvious due to the lateral displacement of the patella. In a reduced position attempts to manually push the patella laterally results in considerable apprehension (Fairbank's Test) and pain along the torn or stretched medial capsular and retinacular structures. The sunrise view of the patella may show the patella riding laterally in the patellar notch.

Chondromalacia Patellae. An extremely common syndrome in active children, chondromalacia patellae is a precursor to patellofemoral arthritis in the adult. This may be associated with recurrent trauma to the knee, particularly blunt trauma to the anterior aspect of the knee. It may also be associated with quadriceps malalignment syndromes such as genu valgus, genu varus, patella alta, or laterally placed patellar tubercle. A history of subluxating or dislocating patella may be elicited. Physical examination shows patellar grating and the Brittain test is positive.

Chondromalacia Fabellae. The fabella articulates with the posterior aspect of the lateral femoral condyle. A syndrome analogous to that of the chondromalacia patellae occurs. Patients loading their knees in full extension seem prone to this injury. It has been observed in ballet dancers. Examination shows localized tenderness over the fabella particularly on compressing the fabella against the femoral condyle. Active contraction of the gastrocnemius with the knee in full extension may also aggravate the pain.¹

Osteochondritis Dissecans. Osteochondritis dissecans may not be associated with specific trauma. The pain is generally of insidious onset and the patient has an observable quadriceps atrophy. The involved area of the femoral condyle may be palpable producing tenderness. However, if the lesion or a loose body is within the intercondylar notch on the posterior aspects of the femoral condyles the lesion may only be observable in the intercondylar notch view of the radiographs. Arthrography or arthroscopy in this instance may be helpful to determine whether the osteochondral fragment is loose within the knee.

Osgood-Schlatter's Disease. Localized swelling, and tenderness over the tibial tubercle with pain on contraction of the quadriceps mechanism against resistance establishes this diagnosis. Although radiographs may show "frag-

mentation" of the tibial tubercle it is important to note that ossification of the tibial tubercle is multicentric and so-called fragmentation does not represent a pathological finding. The only radiographic finding consistent with the diagnosis is soft tissue swelling over the tibial tubercle.

Patellar Tendonitis. This diagnosis probably represents a spectrum of conditions induced by overuse of the quadriceps mechanism. Specific syndromes having subtle pathogenetic differences include patellar osteochondritis, partial rupture of patellar tendon, "jumper's knee," and avulsion of lower pole of patella. The patients have localized tenderness at the lower pole of the patella and/or the adjacent patellar tendon which may or may not be associated with swelling. Separation of the patellar tendon from the lower pole will result in a palpable defect at that point. Radiographs may show "fragmentation" of the lower pole of the patella suggestive of avulsion of bony fragments. It is probable that these represent multicentric centers of ossification, and the lesion is analogous to that of Osgood-Schlatter's disease at the opposite end of the patellar tendon.¹⁰

Supracondylar Cortical Avulsion. The patients complain of pain in use of the knee particularly in maneuvers requiring contraction or stretching of the adductor musculature of the thigh. The pain is over the posterior medial aspect of the knee proximal to the joint line. An area of localized tenderness can be palpated over the junction of the medial femoral condyle with the shaft or along the adjacent portion of the supracondylar ridge. Radiographs show a cortical irregularity at the level of the insertion of the adductor magnus tendon into the supracondylar ridge.³

Sprains. A sprain implies disruption of a ligamentous structure. This diagnosis should be made with considerable reservation in a growing child since the epiphyseal plates adjacent to the joint are probably more likely to be injured than the ligaments. On physical examination it may be difficult to differentiate ligamentous instability from abnormal motion at the epiphyseal plate. If there is doubt, stress views under radiographic control are indicated.^{6,9}

Epiphyseal Injuries Salter-Harris Type I. In this injury the epiphysis is separated from the metaphysis through the substance of the epiphyseal plate. Many such injuries reduce spontaneously

and radiographs may show no displacement and physical examination disclose no deformity. Careful palpation along the course of the epiphyseal plate, however, will demonstrate tenderness localized to the periphery of the plate. Follow up radiographs two weeks after the injury may show periosteal new bone formation about the adjacent metaphysis."

Pyogenic Arthritis. Generally patients with pyogenic arthritis are febrile and acutely ill. There is considerable muscle spasm about the joint, and the patients will not permit passive flexion or extension of the knee (pseudoparalysis). Infection with indolent organisms or instances of partial or inadequate antibiotic treatment may result in attenuation of signs and symptoms. Arthrocentesis for cell count, culture, and sensitivity are indicated. Physical examination will disclose an effusion and radiographs may show osteopenia secondary to adjacent inflammation in longer standing cases. Since pyogenic arthritis may arise from adjacent osteomyelitis a careful consideration for an adjacent bone infection should be carried out. The history of penetrating wounds is important since the anticipated organisms from exogenous versus hematogenous infections is quite different.

Osteomyelitis. Osteomyelitis typically originates in the metaphyseal end of the long bone. Occurring in the femur or proximal tibia, the patient may describe the pain as being in his knee. Systemic signs generally suggest the presence of infection but indolent organisms or prior inadequate antibiotic treatment may result in attenuation of clinical symptoms and signs. Radiographs should include the bones well above and below the knee. A bone scan is helpful in localizing early osteomyelitis prior to changes on a standard radiograph.

Bone Tumors. Bone tumors in children also typically arise from the metaphyseal ends of the bones and those in the femur and proximal tibia may be described by the patient as producing knee pain. Radiographic and bone scan studies should include bone well proximal and distal to the knee.

Hip Disease. It is well established that diseases of the hip may produce pain that is referred to the knee, generally to the medial aspect of the knee. The anatomical rationale for this is the common sensory supply to the hip and knee by the obturator nerve. Consequently, knee pain in the child should

always lead one to think of such entities as: toxic synovitis, slipped capital femoral epiphysis, Legg-Calve-Perthe's disease, and pyogenic arthritis of the hip. Physical examination will generally show loss of range of motion of the hip, especially decreased internal rotation. Radiographic assessment of the hip joints are indicated when diagnosis cannot be established at the knee.

SUMMARY

Differential diagnosis of knee pain in the pediatric age group is often difficult and frustrating. Delays in diagnosis and, therefore, delays in treatment can be minimized by attention to pertinent historical and physical examination details.

REFERENCES

1. Barenfeld, Philip A., and Weseley, Martin S.: Painful Fabellae Syndrome, *N.Y. State Journal of Medicine*, 75:1735-1736, 1975.
2. Brewer, Earl J.: *Juvenile Rheumatoid Arthritis*, W. B. Saunders Company, Philadelphia, 1970.
3. Bufkin, W. Jackson: The Avulsive Cortical Irregularity, *Amer. Jour. Roentgen.*, 112:487-492, 1971.
4. Friedman, S. G.: Conversion Symptoms in Adolescents, *Pediatric Clinics of North America*, 20(4): 873-882, 1973.
5. Hoppenfeld, Stanley: *Physical Examination of the Spine and Extremities*, Appleton-Century-Crofts, New York, 1976.
6. Larson, Robert L., and McMahan, Robert O.: The Epiphyses and the Childhood Athlete, *JAMA*, 196:99-104, 1966.
7. Oster, J., and Nielson, A.: Growing Pains: A Clinical Investigation of a School Population, *Acta Paediat. Scand.*, 61:329-334, 1972.
8. Oster, Jakob: Recurrent Abdominal Pain, Headache, and Limb Pains in Children and Adolescents, *Pediatrics*, 50:429-436, 1972.
9. Rang, Mercer: *Children's Fractures*, J. B. Lippincott Company, Philadelphia, 1974.
10. Smillie, I. S.: *Diseases of the Knee Joint*, Churchill Livingstone, Edinburgh and London, 1974.
11. Tachdjian, Mihran, O.: *Pediatric Orthopedics*, W. B. Saunders Company, Philadelphia, 1972.

General Anesthetics and Hepatic Toxicity

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Each year approximately 20,000,000 anesthetics are performed in the United States to patients undergoing surgery, delivery, or diagnostic procedures. Mortality directly attributable to the anesthetic experience approximates 1 per 3,000 administration. Although accurate documentation is not available it is believed that most deaths in the peri-anesthetic period are due to "pilot error," that is acts of commission or omission on the part of the anesthetist. A smaller percentage are due strictly to unusual pharmacologic effects which either have not or cannot be eliminated by careful preoperative evaluation.

General anesthetics at clinical employed concentrations are non-specific depressors of biochemical, and consequently, physiologic functions. Unlike many drugs employed in medicine, anesthetics do not attach to specific receptor sites and cannot be pharmacologically antagonized by specific antidotes. Because of inherent physico-chemical properties of inhalation anesthetics, the volume of distribution in the body is extensive. By this is meant that the drugs (after attainment of equilibrium) are found in the extracellular compartment of the body, and by virtue of a high degree of lipid solubility, are extensively concentrated intracellularly. Anesthetics alter structures of intracellular membranes, enzymes, and proteins by physical displacement. It is recognized that modern anesthetics such as halothane (Fluothane) and enflurane (Ethrane) are relatively inert from a chemical point of view and do not form strong bonds (i.e. covalent bonds) with contiguous biologic macromolecules. It should be noted that anesthetics are administered at astronomic dosages compared to n

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gms. For example, at equilibrium a 70 individual may absorb more than 10 m of halothane.

Because of this loose and non-specific binding to integral cellular constituents, a variety of altered functions are part of the anesthetic state. To some but a few, there is reduced blood pressure due to sympathetic nervous system inhibition, a negative inotropic effect on the myocardium, reduced renal blood flow and glomerular filtration rate. CNS depression of ventilation, depression of intermediate metabolism in the liver, etc. Yet because of the ephemeral nature of anesthetics, soon after the drug is discontinued it can be correctly anticipated that normalcy of vital functions will resume. Occasionally, this anticipated result does not occur, and more permanent oxygen depression ensues—a true toxicity. The liver appears to be an organ at risk for severe and unpredictable toxicity following an otherwise well-conducted general anesthetic.

The newer halogenated inhalation anesthetics represent significant advances in anesthesia pharmacology since these drugs possess characteristics of rapid induction and emergence, potency, non-flammability, with minimal post-anesthetic nausea and vomiting. At the present time, the only suitable alternate non-flammable general anesthetic technique is nitrous oxide-rep-
tant-narcotic which has several intrinsically poor features such as severe post-anesthetic respiratory depression and awareness during anesthesia. Halothane, introduced into clinical practice in 1957, has remained the most popular anesthetic in this country.

After a brief period of widespread clinical use, anecdotal case reports of unexplained post-anesthetic jaundice began to appear implicating halothane.¹⁻³ The essentials of this syndrome were rarity, pathologic and clinical features distinguishable from viral or toxic hepatitis. There was non-statistically solid inference that there was a higher incidence of "halothane hepatitis" following a second administration. There were also reports indicating that middle age and obesity were predisposing factors in the development of this complication. Interestingly there was, and has been to the present date, a paucity of reports of this problem in pre-pubertal children. These various reports triggered several independent clinical investigations of the problem and a large nationwide

retrospective survey.⁴ No scientific conclusions could be drawn from these studies except that unexplained halothane anesthesia was a rare occurrence (approximately 1:30,000 administrations) and that the overall safety record of the anesthetic was excellent. Laboratory animal experiments during this era failed to reveal a direct hepatotoxic action of halothane.

Hampered by lack of an appropriate animal model of direct toxicity with which to work, hepatologists searched for other possible mechanisms of halothane hepatotoxicity and implicated an allergic or hypersensitivity type of reaction primarily by exclusion. Unfortunately, the very tenuous hypothesis that allergy could be a vector in anesthetic hepatitis took firm roots and altered the practice of anesthesia considerably, at times possibly not in individual patient's best interests. Documentation of an allergic mechanism has been attempted⁵ but the concept that hypersensitivity arises from the parent anesthetic molecule is highly suspect in light of recent experiments.^{6,7} "Challenge tests" (inhalation of subanesthetic concentrations for a short period) reported to be positive insofar as producing elevated liver enzymes in individuals was used as support for the "sensitivity" hypothesis.⁸ However, the only information that such a challenge reveals is that an idiosyncratic reaction has occurred, and does not establish the mechanism of that reaction.

What are the prevalent concepts concerning mechanism of halogenated anesthetic viscerotoxicity and guidelines for avoiding this complication? A very important facet of the biochemical pharmacology of the halogenated anesthetics has been recognized for only a decade. For years it was taught categorically that these compounds were inert and not metabolized in the body. It is now recognized that there is considerable biotransformation, primarily by the NADPH-O₂ dependent mixed function oxidases of the hepatic endoplasmic reticulum (microsomal enzymes).⁹ Such biotransformation normally is designed to convert lipid soluble drugs (such as anesthetics) into polar, water soluble derivatives capable of renal elimination. However, certain amounts of quite reactive intermediates which react with tissue macromolecules may be produced on occasion by these processes.

Chloroform was widely employed as

an anesthetic for one hundred years. Although frequent enough to be acknowledged, "delayed chloroform poisoning" or post-anesthetic jaundice was not an inevitable result of the majority of chloroform anesthetics. In fact, the reason for abandoning chloroform was predicated primarily on sudden ventricular arrhythmias rather than on hepatic effects. It is now recognized that chloroform hepatotoxicity is due to biotransformation to reactive intermediates such as $\cdot\text{CCl}_3$.¹⁰ The variables which determine in an individual case whether chloroform will or will not produce centrilobular liver necrosis are:

1. State of hepatic microsomal enzymes. These enzymes can be made to increase the rate of biotransformation of drugs by chronic treatment with inducing compounds such as phenobarbital. Induction of chloroform biotransformation produces larger quantities of the reactive intermediates $\cdot\text{CCl}_3$, the unpaired electron of which can attack and degrade important cellular constituents. In addition to altering these enzymes by external inducing drugs, genetic influences alter the qualitative and quantitative biotransformation of drugs to a great degree.

2. Level of hepatic antioxidants. Oxidative processes, some with reactive intermediates are constantly occurring in the liver. Normally, toxic intermediates are "quenched" by intrinsic antioxidants. Such antioxidants include the polypeptide reduced glutathione and certain metal ions such as zinc and selenium. Simple depletion of glutathione in animals followed by chloroform anesthesia will result in massive centrilobular necrosis in the absence of hepatic microsomal enzyme induction.

3. Dose. Halothane, even though a halogenated hydrocarbon, does not produce liver necrosis by a mechanism precisely similar to chloroform in animal studies. The major biotransformation pathway of halothane, like chloroform is oxidative. The end metabolic products are trifluoroacetic acid, and bromide and chloride ion, all thought to be innocuous.¹¹ Approximately 18 percent of an absorbed dose of halothane is metabolized in man. If the biotransformation of halothane is induced by phenobarbital pretreatment and adequate oxygen is supplied, hepatic damage by phenobarbital pretreatment and adequate oxygen is supplied, hepatic damage by halothane is minimal in animals, unlike chloroform. Cohen and associates¹² have recently demonstrated the presence

of small quantities of potentially reactive urinary metabolites of halothane in man, however. These include N-trifluoroacetyl-2-aminoethanol and N-acetyl-5-(2-bromo-2-chloro-1, 1-difluoroethyl)-L-cysteine. However, the usual small amounts of these metabolites preclude clinically evident hepatic damage.

Recently two separate animal models mimicking the human lesion of "halothane hepatitis" (centrolobular necrosis, elevated SGPT and SGOT, etc) have been produced.^{13, 14} Both models predicate as mechanism quantitative and qualitative alteration of halothane biotransformation, primarily to reductive (non-oxygen dependent) metabolism rather than to the usual oxidative metabolism. Thus a mechanism of activation of halothane to reactive intermediates capable of producing centrolobular necrosis would seem quite possible in man. This abnormal biotransformation could be altered by genetic and environmental factors. Lack of attack in infants and children could be hypothesized to be the result of the well-known low activity of microsomal enzyme prior to puberty.

An analysis of unexplained jaundice following halothane anesthesia in Sweden in the years 1966-1973 shows an incidence of this problem as 1:7000 administrations with a fatal reaction for each 110,000 administrations.¹⁵ Obesity and middle age appeared to be contributing factors. It is interesting to note that the obese individual metabolizes more anesthetic than the svelte. Although the attack rate is low, halothane was the seventh ranked drug for fatal reactions in Sweden, sandwiched between chloroanphericol and the penicillins. Oral contraceptives were adjudged to be the leading cause of fatal drug reactions in this survey. Although animal experiments strongly implicate abnormal biotransformation as the proximate vector of halothane hepatic damage, few clinical guidelines concerning halothane use can be formulated with certainty. Studies in Great Britain indicate closely repeated serial halothane anesthetics can produce elevated liver enzymes, but no frank case of liver necrosis was observed in this study.¹⁶ In light of current knowledge, it is probably correct to avoid halothane if the patient gives a history of unexplained jaundice following a previous halothane administration. Also, frequent repetition of halothane, particularly in the obese middle aged pa-

tient may be poor practice, but this aspect is certainly not settled.

Enflurane is a new halogenated anesthetic. So far, there have been few clinical reports of unexplained jaundice following its use. Whether this represents enflurane as a drug with decreased hepatotoxic potential or merely indicates a low user popularity cannot be determined at this time.

SUMMARY

New halogenated anesthetics represent a significant pharmacologic advance in patient safety. However, members of these drugs seem to produce a rare, unpredictable syndrome of post-anesthetic centrolobular necrosis of the liver. The likely explanation for this adverse reaction is host alteration of the biotransformation of these anesthetics to reactive intermediates which attack and destroy hepatic macromolecules. In spite of this problem, the useful features of these anesthetics should not preclude their use.

BIBLIOGRAPHY

1. Lindenbaum J., Leifer E.: Hepatic necrosis associated with halothane anesthesia. *New Eng J Med* 268:525-530, 1963.
2. Brody G.L., Sweet R. B.: Halothane anesthesia as a possible cause of massive hepatic necrosis. *Anesthesiology* 24:29-37, 1963.
3. Peters R., Edmondson H., Reynolds T., et al.: Hepatic necrosis associated with halothane anesthesia. *Am J Med* 47:748-764, 1968.
4. The National Halothane Study: A study of the

possible association between halothane and anesthesia and postoperative hepatic necrosis. *Hy J.P. Bunker, W.H. Forrest, Jr., F. Moste et al. Bethesda, National Institute of General Medical Sciences, 1969.*

5. Paronetto F., Popper H.: Lymphocyte stimulation induced by halothane in patients with hepatitis following exposure to halothane. *N Eng Med* 283:277-284, 1970.
6. Moulton P.J.A., Adjukiewicz A.B., Gaylarde P.M. et al.: Lymphocyte transformation in halothane related hepatitis. *Br Med J* 2:69-70, 1975.
7. Moulton P.J.A., Sherlock S.: Halothane-related hepatitis. *Quart J. Med* XLIV, No 173, 9:114, 1975.
8. Klatskin G., Kimberg D.V.: Recurrent hepatitis attributable to halothane sensitization: an anesthetist. *N Eng J Med* 280:515-522, 1969.
9. Van Dyke R.A.: Metabolism of volatile anesthetics. III. Induction of microsomal dechlorinating and ether-cleaving enzymes. *J Pharmacol Exp Ther* 154:364-369, 1966.
10. Brown B.R. Jr., Sipes I.G., Sagalyn A.M.: Mechanisms of acute hepatic toxicity: Chloroform, halothane and glutathione. *Anesthesiology* 41:554-561, 1974.
11. Rehder K., Forbes J., Alter H., et al.: Halothane biotransformation in man. A quantitative study. *Anesthesiology* 28:711-715, 1967.
12. Cohen E.N., Trudell J.R., Edmunds H.N., et al.: Urinary metabolites of halothane in man. *Anesthesiology* 43:392-401, 1975.
13. Sipes I.G., Brown B.R. Jr.: An animal model of hepatotoxicity associated with halothane anesthesia. *Anesthesiology* 45:622-628, 1976.
14. McLain G., Brown B.R. Jr., Sipes I.G.: Unpublished observations.
15. Bottiger L.E., Dalen E., Hallen B.: Halothane induced liver damage: An analysis of the material reported to the Swedish adverse drug reaction committee, 1966-1973. *Acta Anaesth Scand* 20:40-46, 1976.
16. Trudell J., Peto R., Crampton-Smith A.: Controlled trial of repeated halothane anaesthesia in patients with carcinoma of the uterine cervix treated with radium. *Lancet* Apr 12:821-82, 1975.

Clinical Contrasts in the Presentation of Pneumococcal Meningitis

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Abstract: Meningitis due to *strep. pneumoniae* remains a disease with significant mortality despite appropriate antibiotic therapy. Two cases are presented illustrating 1) meningitis in the alcoholic with bacteremia 2) recurrent meningitis in an adult patient with a history of adolescent head trauma. Predictive features suggesting an unfavorable prognosis include: delayed therapy, fulminant disease, advanced age, accompanying illness, coma, seizures, low CSF white cells, large numbers of CSF bacteria and high titers of CSF bacterial antigen.

INTRODUCTION

Streptococcus pneumoniae (pneumococcus) is the commonest cause of acute bacterial meningitis in the mature adult population. It is a disease with considerable variation in its clinical presentation, response to therapy, sequelae and mortality. Fairly divergent points in the wide spectrum are represented by two patients who presented to the Tucson VA Hospital within a 14 day period: the first a jaundiced, alcoholic man with pneumonia and bacteremia, the second a healthy man with a distant history of head trauma and prior episodes of meningitis.

Cases:

1) This 52-year-old Mexican-American male was admitted stuporous with "several week" history of an upper re-

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tory illness. Headache with progressive obtundation began 24 hours before admission. Shortly after arrival he had a generalized seizure.

Exam: T. 105° BP 110/65 R. 24 P. 98. He was somnolent but could be aroused. Physical findings included meningismus, scleral icterus and fine inspiratory crackles in the right mid-lung field. There were no signs of cranial trauma and no focal lesions.

Lab: Lumbar puncture (LP) revealed grossly turbid CSF with opening pressure 300 mmH₂O containing 196,000 WBC's (all neutrophils). Glucose was undetectable (blood sugar 220 mg.%) and protein 750 mg.%. Gram stain revealed abundant Gram ⊕ diplococci (see Figure 1). Chest film showed right upper lobe pneumonia. Cultures of blood, sputum and CSF were positive for *strep. pneumoniae*.

Course: Penicillin G 4.0 × 10⁶ U q 4 h was started within minutes and continued for a total of 18 days. Mental status began improving after about 24 hours on antibiotics and he was alert and oriented by 3 days. Clinical improvement continued and he became afebrile on day 8. Repeat lumbar puncture on day 16 showed 16 cells (2 neutrophils, 14 mononuclears), glucose 67% (blood 95 mg.%), and protein 59 mg.%.
Follow-up: He was discharged on the 18th day and has been free of sequelae after multiple outpatient visits.

This 50-year-old male was admitted with an 18 hour history of progressive headache, fever, and chills. He reported prior history of mild upper respiratory infection symptoms beginning about 7 days earlier. At the age of 12 he was thrown from a horse and struck his head with a short period of unconsciousness. At age 16 he had CSF rhinorrhea. At age 20 he had an episode of pneumococcal meningitis and a year later meningococcal meningitis. Both were treated promptly without complications. He had no CSF rhinorrhea until several weeks before admission when clear fluid began dripping from his nose when he bent forward.

Exam: T. 101° P. 90 R. 19 BP 170/90. The patient was alert and oriented but complained of severe generalized headache. Marked nuchal rigidity was noted. Pupils were normal. No secretions were detectable in anterior nares. Ears, skin, oropharynx, chest, pharynx were all normal.

Lab: LP: Opening pressure 215 mmH₂O. WBC 3400 (all neutrophils)

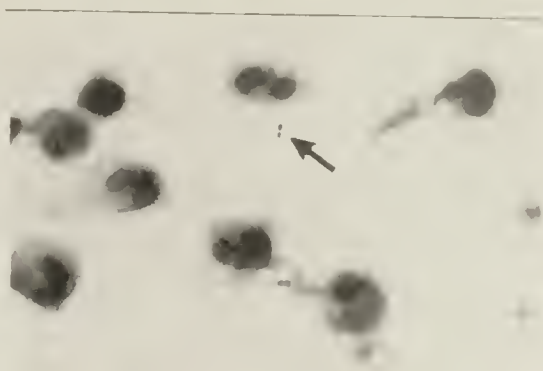


Fig. 1: Case 1 Gram Stain of CSF.

Protein: 228 mg.%. Glucose: 34 mg.% (Blood: 120 mg.%). Gram smear: no organisms seen. Chest film: normal. CSF culture: *strep. pneumoniae*. Blood culture: negative. Chest and skull x-rays: normal. Ampicillin 2.0 g q 4 h. IV was started within 45 minutes of admission and continued for a total of 18 days. He was markedly improved within 24 hours and was ambulating by 48 hours. He became afebrile on the 7th day. A radio-nuclide cisternogram was started on the 10th day and showed no leakage of radio-labelled material into absorptive pledgets placed in either nostril. He was discharged on the 23rd day and has remained asymptomatic and without signs of recurrent CSF rhinorrhea.

Discussion: Pneumococcal meningitis is a disease of extraordinary variability. The organisms are uniformly extremely penicillin-sensitive, as are all *strep. pneumoniae*, but mortality varies between 13 and 60% in recent series.¹ Some of the features associated with poor prognosis are listed in Table 1.

Despite a combination of alcoholism, stupor, pneumonia and seizure activity, our first patient had a remarkably uncomplicated course. Approximately 25% of patients with pneumococcal meningitis have associated pneumonia.² The precipitating event in such cases is presumably the bacteremia which is demonstrable in about half of patients with meningitis. However, in some cases the bacteremia might be secondary to the meningitis rather than vice versa. This has been established in 40% of dogs given experimental pneumococcal meningitis by intrathecal inoculation.³

Local abnormalities (trauma, otitis media, sinus or mastoid disease, or CSF leak) constitute the other major predisposition to pneumococcal meningitis. Case 2 illustrates the long interval which can occur between separate episodes of recurrent bacterial meningitis. Recurrence of the CSF rhinorrhea after so long a normal period without additional trauma is unusual but is occasionally seen.⁴ This possibility can't be ruled out by the failure of CSF radiolabel to appear in the patient's anterior nares because the leakage can be intermittent. Sometimes the episode of acute meningitis apparently leads to the sealing of the CSF leak. When the leak persists, reparative surgery is often necessary to correct the defect. Occasionally, when there are repeated episodes of bacterial meningitis, CSF leakage, although suspected, cannot be confirmed. Surgical repair in such an instance is impossible.

FACTORS ASSOCIATED WITH POOR PROGNOSIS

1. Seizures
2. Coma
3. Major Neurologic Dysfunction
4. Low CSF Leukocytes in Advanced Disease
5. High Polysaccharide Antigen
6. Fulminant Course
7. Delay Prior to Onset of Treatment
8. Associated Disease (eg. Pneumonia)
9. Bacteremia
10. Advanced Age

Table 1: Features Associated with a Poor Prognosis in Pneumococcal Meningitis.

since there is no anatomical localization. The remarkable capability of patients to withstand repeated episodes of meningitis is demonstrated by one 22-year-old patient who survived 11 episodes of pneumococcal meningitis without neurological residua.⁵

Prophylactic antibiotics have been recommended following skull fracture.⁶ Others⁴ have criticized this practice pointing out the absence of any controlled study to confirm its value. The most dramatic example of the harmful potential inherent in extensive prophylactic antibiotic usage is the report by Price and Sleight.⁷ An epidemic of *klebsiella aerogenes* infections abruptly terminated coincident with the discontinuation of the heavy prophylactic use of ampicillin in a neurosurgical intensive care unit.

A prolonged duration of illness prior to hospitalization is often associated with unfavorable outcome. Some authors have found that those patients with the shortest, most rapidly progressive courses fare worst.¹ These observations are not necessarily mutually exclusive. Both are likely to be correct in that they implicate the hazard of delayed therapy, on one hand, and the potential for the pneumococcus to cause fulminant sepsis on the other. The local suppurative complications leading to focal neurologic deficit and seizures are probably more likely to develop in a patient with a slowly advancing indolent disease course. On the other hand, explosive and rapidly progressive pneumococcal disease is seen in situations with immunological impairment such as hypogammaglobulinemia and splenectomy. Splenic dysfunction due to sickle cell disease only partially explains the poor outlook of the black patients with rapidly progressive disease reported by Baird¹ since only 5% of their black patients had the sickle cell abnormality.

One of the most interesting observations in the Baird study is the fact that mortality for patients treated with penicillin and chloramphenicol concurrently was exactly the same as that with penicillin alone: 42%. For years since Lepper and Dowling⁹ showed in 1951 that mortality in their combination therapy group (penicillin plus tetracycline) was twice that with penicillin alone, there has been reluctance to use a bacteriostatic drug (such as chloramphenicol) and a bactericidal drug (penicillin) together. This is not a major issue in a case as obvious as our case 1. However, in a

patient with a negative CSF Gram smear such as case 2 or particularly in a child with possible *hemophilus influenzae* meningitis this is of potential concern. The increasing frequency of ampicillin-resistant, type B *h. influenzae* has led many pediatricians to start therapy with chloramphenicol and ampicillin pending cultural confirmation and antibiotic sensitivity from the microbiology laboratory. The cautions regarding combination and static drug therapy raised by Lepper and Dowling and subsequently by others¹⁰ must be weighed against the newer risk of ampicillin-resistant *h. influenzae* meningitis. In our case 2, once there was cultural confirmation of *strep. pneumoniae*, it would have been appropriate to discontinue ampicillin in favor of parenteral penicillin G, a drug of greater efficacy than ampicillin against sensitive organisms.

As with most invasive diagnostic procedures, lumbar puncture has associated risk. In the febrile, obtunded patient with meningismus and without papilledema it is clear that LP is a critically important test to be done as quickly as possible. In many patients, however, the clinical presentation may be much less characteristic, particularly in older patients. Brain scan, computerized axial tomography and cerebral arteriography all have a place in an individual case to rule out intra-cranial mass lesions before undertaking LP. If so, such studies should be done expeditiously so that LP can be done as quickly as possible. The exact risk of herniation as a consequence of LP is difficult to determine but it has been estimated to be 1-2% in the presence of increased intracranial pressure from all causes.¹¹ Others have estimated the risk to be higher.¹² Herniation as a consequence of LP is reported in bacterial meningitis. Swartz and Dodge indicate that this complication occurred in 6 of 147 cases of *h. influenzae*, *n. meningitidis* and *strep. pneumoniae* meningitis.² Whether this is a true cause and effect relationship is difficult to determine, however, since cerebral edema and spontaneous herniation is seen in fatal cases of meningitis even without lumbar puncture. The highest average opening pressures recorded by Swartz and Dodge were in their group of patients with ultimately fatal pneumococcal meningitis.

In the febrile patient with headache, meningismus and fever, brain abscess would be the major alternative diagnosis in the differential. Brain scan is the

most reliable diagnostic study to exclude this possibility¹³ and this should be done on an emergency basis if meningitis also being considered. In general, however, the rapid onset of bacterial meningitis is sufficiently characteristic that it is unusual that LP must be delayed pending a brain scan.

On occasion a potentially disastrous "middle course" is pursued, namely antibiotics are given without prior LP and brain scan is scheduled for a more convenient later time. Sometimes the antibiotic dosage is small or an inappropriate drug such as cephalosporin¹⁴ is given further compound the problem. The CSF can be rendered sterile quickly with therapy on antibiotics and an LP done then can fail to confirm the bacterial diagnosis.

If available, examination of the CSF for pneumococcal polysaccharide antigen can be very helpful. Tugwell *et al.* found this determination to be positive in 41 of 42 of their patients. Moreover 8 of 10 patients continued to be positive when checked again after 3 days of therapy. Several authors have sought to use this test as a means of establishing bacterial diagnosis in partially treated meningitis with comparable results. The reliability of counterimmuno-electrophoresis for detecting pneumococcal antigen in CSF depends in large part on the quality of the antisera employed. Other technical details of the test procedure are also important. A large amount of bacterial antigen and large numbers of bacteria in the CSF are predictive of a bad prognosis.¹⁶

The duration of antibiotic therapy in pneumococcal meningitis should be in the range of 14 days and occasionally longer if clinical response is delayed or fever is prolonged. The average dose in an adult would be 4.0 million units intravenously every 4 hours. In a penicillin-allergic patient the alternative agent is chloramphenicol 1.0 gram IV every six hours initially and switch to oral administration when the patient can tolerate this.

Permanent neurologic sequelae occur in some survivors of pneumococcal meningitis.² Although abnormalities frequently disappear during therapy, 10 of Tugwell *et al.*'s 42 patients were left with neurologic deficit ranging in severity from cranial neuropathy to hemiplegia. Eighth nerve impairment in particular has been recognized as an important and frequent sequela of meningitis. Our case 1 had several features

associated with poor outcome (alcoholism, seizure activity, and stupor) but did very well. Our case 2 did well as expected.

One common feature in these two very dissimilar cases was that both were approached aggressively upon admission with confirmation of the diagnosis and institution of antibiotic within one hour of admission. Brisk diagnosis and administration of appropriate antibiotic is the best way of minimizing the disturbing mortality in this treatable disease.

REFERENCES

1. Baird, D. R., Whittle, H. C., Greenwood, B. M.: Mortality from Pneumococcal Meningitis. *Lancet* 1:344 (1976).
2. Swartz, M. N., Dodge, P. R.: Bacterial Meningitis—A Review of Selected Aspects. *N.E.J.M.* 272:779, 842, 954, 1003 (1965).
3. Petersdorf, R. G., Luttrell, C. N.: Studies on the Pathogenesis of Meningitis. I. Intrathecal Infection. *Clin. Invest.* 41:311 (1962).
4. Hand, W. L., Sanford, J. P.: Posttraumatic Bacterial Meningitis. *Ann. Int. Med.* 72:869 (1970).
5. Whitecar, J. P., Reddin, J. L., Spink, W. W.: Current Pneumococcal Meningitis. *N.E.J.M.* 275:1285 (1966).
6. Brawley, B. W., Kelly, W. A.: Treatment of Basal Skull Fractures with and without Cerebrospinal Fluid Fistulae. *J. Neurosurg.* 26:57 (1967).
7. Price, D. J. E., Sleight, J. D.: Control of Infection due to *Klebsiella aerogenes* in a Neurosurgical Unit. Withdrawal of all Antibiotics. *Lancet* 2:1213 (1970).
8. Tugwell, P., Greenwood, B. M., Warrell, D. A.: Pneumococcal Meningitis: A Clinical and Laboratory Study. *Quart. J. Med.* 45:583 (1976).
9. Lepper, M. H., Dowling, H. F.: Treatment of Pneumococcal Meningitis with Penicillin Compared with Penicillin plus Aureomycin: Studies Including Observations on an Apparent Antagonism Between Penicillin and Aureomycin. *Arch. Int. Med.* 88:489 (1951).
10. Mathies Jr., A. W., Leedom, J. M., Ivler, D.: Antibiotic Antagonism in Bacterial Meningitis. *Antimicrob. Ag. Chemother.* pp. 218 (1967).
11. Korein, J., Cravioto, H., Leichach, M.: Reevaluation of Lumbar Puncture: A Study of 129 Patients with Papilledema or Intracranial Hypertension. *Neurology (Minneapolis)* 9:290 (1959).
12. Duffy, G. P.: Lumbar Puncture in the Presence of Raised Intracranial Pressure. *Brit. Med. J.* 1:407 (1969).
13. Crocker, E. F., McLaughlin, A. F., Morris, J. G.: Technetium Brain Scanning in the Diagnosis and Management of Cerebral Abscess. *Am. J. Med.* 41:192 (1974).
14. Fisher, L. S., Chow, A. W., Yoshikawa, T. T., Lize, L. B.: Cephalothin and Cephloridine Therapy in Bacterial Meningitis: An Evaluation. *Ann. Int. Med.* 82:689 (1975).
15. Rytel, M. W.: Counterimmunoelectrophoresis in the Diagnosis of Infectious Disease. *Hosp. Practice* 75 (Oct. 1975).
16. Feldman, W. E.: Relation of Concentrations of Bacterial Antigen in Cerebrospinal Fluid to Prognosis in Patients with Bacterial Meningitis. *N.E.J.M.* 296:433 (1977).

In Vitro Susceptibility of Tucson Isolates of *Neisseria Gonorrhoeae* to Penicillin, Tetracycline, and Spectinomycin

Antimicrobial susceptibility of *N. gonorrhoeae*

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Kenneth J. Ryan, M.D.

ABSTRACT

In vitro penicillin, tetracycline and spectinomycin susceptibility studies of 49 Tucson, Arizona isolates of *Neisseria gonorrhoeae* were performed and compared to results obtained from other areas of the country. The distribution of penicillin and spectinomycin susceptibility results was comparable to other areas of the country, but a larger proportion of isolates showed relative increased susceptibility to tetracycline. The ranges of minimum inhibitory concentrations (MICs) for penicillin G, tetracycline and spectinomycin were 0.006-1.6 µg/ml, 0.06-1.0 µg/ml, and 1.0-32 µg/ml respectively. Of the gonococcal isolates 12.5% were relatively resistant to penicillin G with MICs \geq 0.5 µg/ml. There were no isolates with relative tetracycline resistance i.e. MIC \geq 2 µg/ml. A positive correlation ($r = 0.73$) between penicillin and tetracycline minimum inhibitory concentrations was also observed.

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INTRODUCTION

Since the advent of penicillin G therapy for gonorrhea, there has been, until recently, a steady increase in gonococcal resistance to penicillin G, thus requiring higher and higher doses for successful treatment. The same trend of increasing gonococcal resistance had also been described for tetracycline. Therefore, there has been a great deal of interest in studying the *in vitro* antimicrobial susceptibility of *Neisseria gonorrhoeae* to penicillin G,^(1,2,3,4) tetracycline⁽⁵⁾ and spectinomycin⁽⁶⁾ and correlating the antimicrobial minimum inhibitory concentrations of infecting organisms to corresponding antibiotic treatment results.^(1,2,5,6) National and international geographical variations in *in vitro* antimicrobial susceptibility have also been described.^(7,8) The present study was done to determine the pattern of *in vitro* penicillin G, tetracycline and spectinomycin susceptibility of *N. gonorrhoeae* isolates from Tucson, Arizona, and to compare these findings with results from other parts of the country.

MATERIALS AND METHODS

Bacteria. Twenty one strains of *N. gonorrhoeae* isolated from the Arizona Health Sciences Center (AHSC) and 28 strains isolated from a local federally funded outpatient gonorrhea screening clinic between June 1973 and January 1975 were studied. All isolates were typical oxidase positive, gram-negative diplococci which fermented dextrose but not sucrose, lactose or maltose. No information regarding symptomatology of infected patients was considered. The isolates were stored in fetal calf serum at -70°C until susceptibility testing was performed.

Antimicrobial susceptibility testing. Minimum inhibitory concentrations (MICs) to penicillin G, spectinomycin, and tetracycline were determined by the agar dilution method.^(3,5) The medium used was GC agar base (Difco) to which was added a sterile, chemically defined supplement supplied by Micro-Tech Diagnostics, Inc., Tucson, Arizona, containing purines, pyrimidines, amino acids, dextrose, vitamin B₁₂, co-carboxylase and DPN. Stock antibiotic solutions were prepared in distilled water from standard powders supplied by Eli Lilly Co. (penicillin G) and UpJohn (spectinomycin and tetracycline), diluted to an activity of 1280 $\mu\text{g}/\text{ml}$ and stored at -70°C . For testing 2-fold dilutions of antibiotic were prepared in Mueller-Hinton (M-H) broth and incorporated into the enriched GC agar pour plate (20 ml per plate). Penicillin G, tetracycline and spectinomycin were tested in dilutions ranging from 0.006-6.4 $\mu\text{g}/\text{ml}$, 0.06-16.0 $\mu\text{g}/\text{ml}$, and 1.0 to 128 $\mu\text{g}/\text{ml}$ respectively.

The gonococcal isolates to be tested were thawed, plated on chocolate agar and incubated in 3-5% CO_2 at 35°C for 18-24 hours. Growth from the plate was suspended in M-H broth, agitated on a Vortex mixer and adjusted to equal a McFarland 0.5 turbidity standard.⁽⁹⁾ The suspension was further diluted 1:20 in M-H broth and applied to the surface of the plates with a Steers replicating device⁽¹⁰⁾ resulting in a final estimated inoculum of 5×10^3 colony forming units. Using the replicator 24 different gonococci and one *Staphylococcus* control were inoculated on each plate. The plates were then incubated in a candle jar at 35°C for 48 hours before reading. The MIC was the lowest concentration of antibiotic that gave complete inhibition of growth. A faint haze due to inoculum or a single colony was ignored.

RESULTS

The results of the gonococcal susceptibility tests are seen in figures 1, 2, and 3. Minimum inhibitory concentrations ranged from 0.006-1.6 $\mu\text{g}/\text{ml}$ for penicillin G (figure 1), 0.06 to 1.0 $\mu\text{g}/\text{ml}$ for tetracycline (figure 2), and 1.0-32 $\mu\text{g}/\text{ml}$ for spectinomycin (figure 3). Table 1 shows how the distribution of *in vitro* antimicrobial susceptibilities of Tucson isolates to penicillin G, tetracycline and spectinomycin compares with reported MICs from other parts of the country.⁽²⁾ There was a relatively resistant population (12.5%) of gonococcal strains with penicillin MICs ≥ 0.5 $\mu\text{g}/\text{ml}$ (table 1). No isolate had a tetracycline MIC ≥ 2 $\mu\text{g}/\text{ml}$ and 30.4% of the organisms had a tetracycline MIC ≤ 0.12 $\mu\text{g}/\text{ml}$ (table 1). All but one organism had a spectinomycin MIC ranging from 8-32 $\mu\text{g}/\text{ml}$ with 83% of the organisms being inhibited by 8 or 16 $\mu\text{g}/\text{ml}$ (table 1). Isolates from AHSC and the screening clinic gave similar susceptibility results with all three antibiotics.

All six *N. gonorrhoeae* isolates with a penicillin MIC of 1.6 $\mu\text{g}/\text{ml}$ had a tetracycline MIC of 1.0 $\mu\text{g}/\text{ml}$, the highest tetracycline MIC observed in the study. Seven additional strains had tetracycline MICs of 1.0 $\mu\text{g}/\text{ml}$ with corresponding penicillin MICs of 0.025 $\mu\text{g}/\text{ml}$ (1 organism), 0.2 $\mu\text{g}/\text{ml}$ (2 organisms) and 0.4 $\mu\text{g}/\text{ml}$ (4 organisms). Figure 4 demonstrates the relationship between penicillin and tetracycline MICs, and statistical analysis reveals a positive correlation coefficient (r) of 0.73. Correlation coefficients (r) between penicillin and spectinomycin MICs and between tetracycline and spectinomycin MICs were 0.14 and 0.44 respectively.

DISCUSSION

Increasing *in vitro* resistance of *N. gonorrhoeae* to penicillin and tetracycline has been demonstrated,^(4,5) but recently this trend appears to have plateaued for penicillin and reversed for tetracycline.⁽²⁾ Treatment failures have also been correlated with increased *in vitro* resistance to penicillin,^(1,2) ampicillin⁽²⁾ and tetracycline (single dose regimen),⁽⁵⁾ but spectinomycin treatment failures do not correlate with *in vitro* resistance of the infecting strain.^(2,6)

In 1944, shortly after the advent of penicillin treatment for gonorrhea, almost all strains of *N. gonorrhoeae* were inhibited *in vitro* by 0.01 $\mu\text{g}/\text{ml}$ of penicillin and at that time treatment with 500,000 units of penicillin G resulted

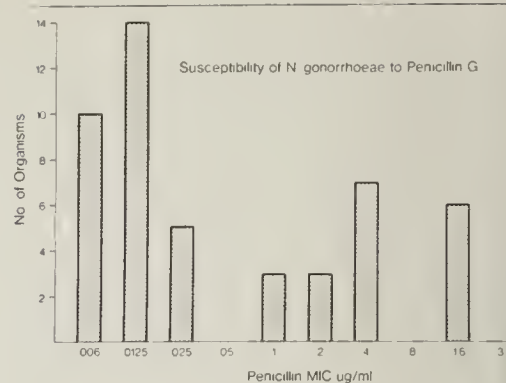


Fig. 1. *Neisseria Gonorrhoeae*.

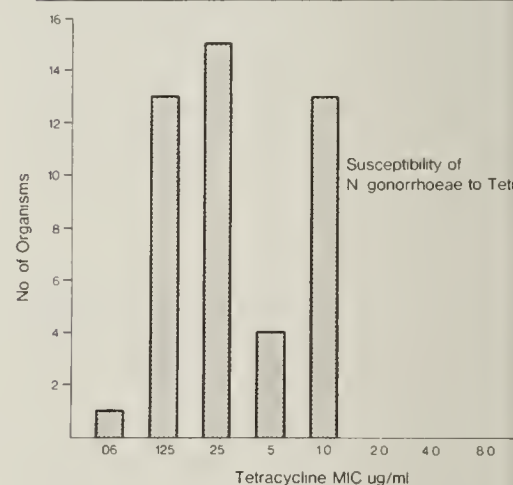


Fig. 2. *Neisseria Gonorrhoeae*.

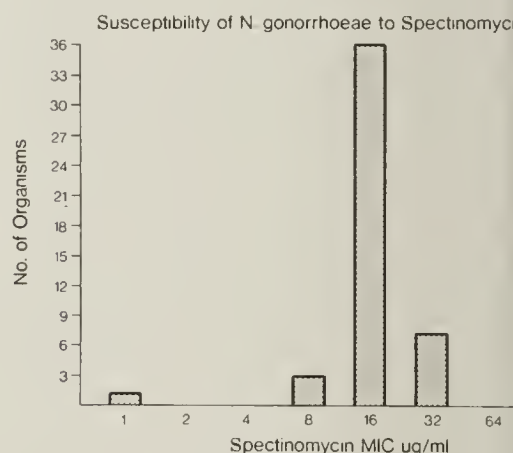


Fig. 3. *Neisseria Gonorrhoeae*.

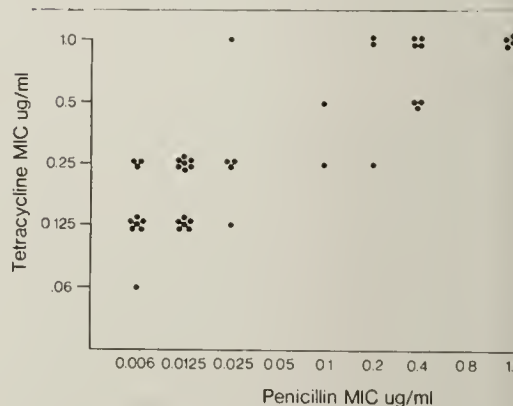


Fig. 4. *Neisseria Gonorrhoeae*.

Table 1. Variation in susceptibility of Tucson isolates of *N. gonorrhoeae* compared to isolates in other parts of the United States.

Location	Strains (%) with Minimum Inhibitory Concentration at Indicated Level								
	Penicillin			Tetracycline			Spectinomycin		
	≤ 0.03 μg/ml	0.06-25 μg/ml	≥ 0.5 μg/ml	≤ 0.12 μg/ml	0.25-1.0 μg/ml	≥ 2.0 μg/ml	≤ 4.0 μg/ml	8-16 μg/ml	≥ 32 μg/ml
Tucson	27.1	60.4	12.5	30.4	69.6	0	2.1	83.0	14.9
Others ^a	21-51	29-68	7-27	1-6	71-92	7-27	0-4	96-99	0-2

^aRange of results from 10 cities included in National Gonorrhea Therapy Monitoring study.⁽¹²⁾

a 95% cure rate.⁽⁷⁾ In a 1954 study by Love and Finland⁽¹¹⁾ the maximum concentration of penicillin required to inhibit the most resistant strains of gonococci was 0.06 μg/ml. Two years later Jaffar, *et. al.*⁽¹²⁾ showed that 22% of gonococcal isolates tested required 0.12 μg/ml of penicillin for inhibition. From 1955 to 1968 the percentage of strains requiring more than 0.03 μg/ml of penicillin to inhibit *in vitro* growth increased from 0.6% to 65%, and from 1965 to 1968 the percentage of strains requiring more than 0.3 μg/ml of penicillin for inhibition rose from 5% to 14%.⁽¹⁴⁾ Recently there have been reports of penicillinase producing penicillin resistant gonococci^(13,14) with *in vitro* penicillin MICs ranging from 0.5 μg/ml to 128 μg/ml depending on the number of bacterial cells in the inoculum.⁽¹³⁾

A 15 year prospective study of intramuscular procaine penicillin treatment (4 million units for men; 4.8 million units for women) of uncomplicated gonorrhea with and without probenecid revealed failure rates of 1.8% and 15.4% for men and 3.7% and 10.4% for women.⁽¹⁾ In this same study isolates from treatment failure cases had significantly higher *in vitro* penicillin MICs than isolates from the entire study population. A recent study by Kauffman *et. al.*⁽¹⁵⁾ revealed an overall 3 to 7 day treatment failure rate of uncomplicated gonorrhea with recommended doses⁽¹⁶⁾ of aqueous procaine penicillin G and probenecid, spectinomycin, tetracycline and ampicillin of 3.2%, 5.2%, 3.8% and 8.2% respectively.

Again in a recent study by Jaffe *et. al.*⁽²⁾ penicillin treatment failure correlated with increased *in vitro* resistance of the infecting organism to penicillin. There was a 13.5% penicillin (in recommended doses with probenecid) failure rate when the penicillin MIC of the infecting organism was 1.0 μg/ml or greater. Ampicillin treatment failure was also shown to correlate with increased *in vitro* resistance of the infecting organism to both ampicillin and penicillin. There was approximately a

19% ampicillin treatment failure rate when the ampicillin MIC of the infecting organism was 0.5 μg/ml or greater, and approximately an 18% ampicillin treatment failure rate when the penicillin MIC was 1.0 μg/ml or greater.

In this same study⁽²⁾ there were too few tetracycline treatment failures for significant correlation studies, and, similar to previous experience, there was no correlation between spectinomycin treatment results and *in vitro* susceptibility studies of the infecting organisms.

The *in vitro* penicillin G and spectinomycin susceptibility results of Tucson gonococcal isolates are comparable to those from other parts of the country (Table 1). However, a larger proportion of Tucson isolates were inhibited *in vitro* by small concentrations (≤ 0.12 μg/ml) of tetracycline (Table 1), implying a population of gonococcal isolates with relative increased susceptibility to tetracycline. This may reflect the recent trend of decreasing *in vitro* resistance to tetracycline,⁽²⁾ but previous local antimicrobial studies are not available for comparison. The therapeutic significance of this finding is unknown.

As reported previously,^(5,17) the present study demonstrates a positive correlation between MICs of penicillin G and MICs of tetracycline. The therapeutic significance of these findings is unknown since there were no isolates with relative tetracycline resistance (MIC ≥ 2 μg/ml).⁽²⁾ In addition, infections caused by such isolates that might prove relatively resistant to tetracycline *in vitro* are apparently effectively treated by the recommended⁽¹⁶⁾ five day course of oral tetracycline.⁽¹⁵⁾

Testing for penicillinase production was not done. However, penicillinase producing strains with the inoculum size used in this study would be expected to have much higher penicillin MICs than were observed. Therefore, it seems unlikely that any of the isolates produced penicillinase. Neither the location of a military base in Tucson nor the proximity to Mexico seemed to exert any

significant adverse effect in terms of increasing the proportion of gonococcal isolates with relative resistance to penicillin.

In summary, the *in vitro* susceptibility of Tucson gonococcal isolates to penicillin G and spectinomycin are comparable to other regions of the country, but there is a larger population of isolates with relative increased susceptibility to tetracycline. A positive correlation between penicillin G and tetracycline MICs was observed. The therapeutic significance of these findings is discussed.

BIBLIOGRAPHY

1. Holmes, K.K., W.W. Karney, J.P. Harnisch, P.J. Wiesner, M. Turck and A.H.B. Pederson. Single dose aqueous procaine penicillin G therapy for gonorrhea: Use of probenecid and cause of treatment failure. *J. Infect. Dis.* 127:455, 1973.
2. Jaffe, H.W., J.W. Biddle, C. Thornsberry, R.E. Johnson, R.E. Kaufman, G.H. Reynolds, and P.J. Wiesner. National gonorrhea therapy monitoring study: *in vitro* antibiotic susceptibility and its correlation with treatment results. *NEJM* 294:5, 1976.
3. Maier, T.W., H.R. Berstein, and L. Zubrzycki. Antibiotic disk susceptibility tests with *Neisseria gonorrhoea*. *Antimicrob. Ag. Chemother.* 5:210, 1974.
4. Martin, J.E. Jr., A. Lester, E.V. Price, and J.D. Schmale. Comparative study of gonococcal susceptibility to penicillin in the United States, 1955-1969. *J. Infect. Dis.* 122:459, 1970.
5. Wiesner, P.J., K.K. Holmes, P.F. Sparling, M.J. Maness, D.M. Bear, L.T. Gutman, and W.W. Karney. Single doses of methacycline and doxycycline for gonorrhea: a cooperative study of the frequency and cause of treatment failure. *J. Infect. Dis.* 127:467, 1973.
6. Pedersen, A.H.B., P.J. Wiesner, K.K. Holmes, C.J. Johnson, and M. Turck. Spectinomycin and penicillin G in the treatment of gonorrhea; a comparative evaluation. *JAMA* 220:205, 1972.
7. Webster, B. The medical Clinics of North America. 56:1055, 1972.
8. Gump, D.W. Increased susceptibility of *Neisseria gonorrhoea* from a rural area. *Antimicrob. Ag. Chemother.* 3:505, 1973.
9. American Society for Microbiology. E.H. Lennette (Ed.). Manual of Clinical Microbiology. 2nd Ed. 1974, 933.
10. Steers, E., E.L. Foltz, and B.S. Graues. An inocula replicating apparatus for routine testing of bacterial susceptibility to antibiotics. *Antibiot. Chemother.* 9:307, 1959.
11. Love, B.D., and M. Finland. Susceptibility of *Neisseria gonorrhoeae* to eleven antibiotics and sulfadiazine. *Arch. Intern. Med. (Chicago)* 95:6, 1955.
12. Thayer, J.D., F.W. Field, H.J. Magnusen, and W. Carson. Sensitivity of gonococci to penicillin and its relation to treatment failures. *Antibiot. Chemother.* 7:306, 1957.
13. Phillips, I. B-Lactamase-producing, penicillin-resistant gonococcus. *Lancet* II, 656, 1976.
14. Ashford, W.A., R.G. Golash, and V.G. Hemming. Penicillinase-producing *Neisseria gonorrhoeae*. *Lancet* II, 657, 1976.
15. Kaufman, R.E., R.E. Johnson, H.W. Jaffe, C. Thornsberry, G.H. Reynolds, and P.J. Wiesner. National gonorrhea therapy monitoring study: treatment results. *NEJM* 294:1, 1976.
16. Center for Disease Control: Gonorrhea-CDC recommended treatment schedules, 1974. *Morbidity and Mortality Weekly Rep.* 23(40):341, 1974.
17. Powell, J.T. and J.H. Bond. Antibiotic resistance in clinical strains of *Neisseria gonorrhoeae* isolated in South Carolina. *Antimicrob. Ag. Chemother.* 10:639, 1976.

Acquired Circulating Anticoagulant in Classical Hemophilia: Treatment with Prothrombin Concentrate

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ABSTRACT

Factor VIII anticoagulants occur in a significant number of severe classical hemophiliac patients. In that factor VIII replacement may compound the problem by raising the inhibitor level, the recent advent of using activated prothrombin complex has been introduced. This report will show the successful use of one of the prothrombin concentrates to manage the bleeding episodes in a severe classical hemophilic patient known to have factor VIII inhibitor for two years.

INTRODUCTION

Factor VIII inhibitors have been noted in 4 to 21% of patients with classical hemophilia.^(1, 2, 3, 4, 5) The administration of high or low dose factor VIII containing blood products will generally lead to heightened antibody titers within five to twelve days which precludes their effectiveness in the therapy of these patients.^(1, 2, 3) Exchange transfusions, plasmapheresis, and immunosuppressive therapy with cytotoxic drugs have all been attempted but have limited value in lowering the factor VIII antibody titers and in controlling bleeding episodes.^(1, 2, 3, 6)

In 1972 Fekete, et al described a new approach to the control of bleeding in this clinical setting by administering "activated prothrombin complex."⁽⁷⁾ Two years later, Kurczynski and Penner successfully managed eight patients with factor VIII inhibitors using a similar preparation.⁽⁸⁾ In 1976, Abildgaard

and Britton, *et al* reported prompt control of 64 bleeding episodes in five hemophilic patients with factor VIII inhibitors with the use of prothrombin complex concentrate.^(3, 9)

The purpose of this report is to show our experience with a patient with classical hemophilia known to have a factor VIII inhibitor for approximately two years. He has received 24 infusions of a prothrombin complex and the data will show that the bleeding episodes could be successfully controlled by this treatment and that no complications have occurred.

CASE REPORT

The patient is a 10½ year old Mexican American male known to have severe classical hemophilia (Hemophilia A, factor VIII deficiency). His previous bleeding episodes responded well to factor VIII replacement therapy until at the age of eight years it was necessary to hospitalize him for an unresponsive hemarthrosis of the left elbow. Radiographs at that time revealed no evidence of a fracture. An inhibitor test showed the presence of a factor VIII anticoagulant in his plasma. The hemarthrosis was treated successfully with the infusion of Kouyne (Cutter Lab). Over the ensuing two years, he has been treated for 24 different bleeding episodes with variable therapeutic responses.

At 9½ years of age, the patient was admitted to the University Hospital for elective dental extraction of four carious teeth. In preparation for the surgery, he was begun on epsilon aminocaproic acid p.o. as previously reported.^(10, 11) He received factor VIII replacement therapy before and after the oral surgery but despite these efforts active bleeding from all four extraction sites continued. However, when Kouyne was added adequate hemostasis was

achieved, bleeding stopped, and the wounds healed. It is of note that during the simultaneous use of Kouyne, Hemophil and Amicar, no complications were noted.

At no time during the treatment course has this patient manifested any of the side effects from prothrombin complex replacement therapy, i.e., headache, flushing, hepatitis, or evidence of intravascular thrombosis. To date, he has received 27 separate prothrombin complex infusions equivalent to 355,000 units of factor IX. His only major complication has been the development of bilateral knee flexion contractures with subluxation due to frequent and often slowly resolving closed space hemorrhage.

METHODS

Platelet poor plasma was obtained by anticoagulating nine volumes of fresh whole blood with one volume sodium citrate-citric acid anticoagulant. The anticoagulated whole blood was centrifuged at 8,000 rpm for 20 minutes at 4°C.⁽¹²⁾ The resultant platelet poor plasma was removed, aliquoted, and frozen for subsequent testing. The tests performed on platelet poor plasma were: (1) activated partial thromboplastin time;⁽¹²⁾ (2) factor VIII assay;⁽¹²⁾ and; (3) qualitative and quantitative estimation of circulating anticoagulant.^(3, 9)

The technique used for the qualitative determination of the inhibitor was as follows:

The partial thromboplastin time was performed on normal platelet poor plasma and on patient platelet poor plasma. Following this a mixture of normal and platelet poor plasma was made and the partial thromboplastin time performed on this mixture at various time intervals, at 37°C. The presence of the inhibitor was detected when the resultant PTT of the mixture was prolonged rather than shortened as compared to a normal control. For the quantitative determination of the inhibitor varying units of factor VIII were added to patient plasma and the effect on the PTT noted after a 60 minute incubation at 37°C.

RESULTS

Qualitative test for factor VIII inhibitor. As can be seen from Table 1, patient plasma mixed with normal plasma and incubated for 60 minutes demonstrated a prolonged partial thromboplastin time. Normally a patient who has a deficiency in a factor has correction of the PTT with no significant pro-

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TABLE 1 Screening Test for Presence of Inhibitor		
	Partial Thromboplastin Time (secs)	
	0 min.*	60 min.*
Patient Plasma	64	74
Control Plasma	32	43
Factor VIII deficient plasma		
Without inhibitor)	70	75
Mixture (Patient - Control)	43	57
Mixture (Factor VIII deficient plasma without inhibitor + Control)	38	42

plasmas incubated in 37°C waterbath for 0 and 60 minutes then PTT performed.

agation after 60 minute incubations. These results suggested that an anti-coagulant existed in the patient which was directed against a clotting factor.

Quantitative determinations. Purified human factor VIII is added to the patient's plasma, incubated for 60 minutes and the PTT performed at the end of the incubation. Inhibitor level is shown on Table 2 as the number of factor VIII units needed to allow a normal PTT. As

Table 2 Inhibitor Levels (units/ml plasma)		
Purified factor VIII added to patients plasma, incubated for 60 minutes at 37°C, and PTT performed. The inhibitor level is expressed as the amount of factor VIII necessary to provide a normal PTT.)		
Date	Inhibitor Level	Remarks
4/71	0	
2/20/75	4	
3/75	4	
8/75	4	
4/75	8	Pre-Konyne
	8	Post-Konyne
1/19/76	4	
4/76	0	Cryoppt Given
1/18/76	16	
12/77	8	

As can be seen, the inhibitor level ranged between 4 and 16 units per ml of plasma. It is interesting to note that at one time, when the level was 0, it rose significantly to 16 units per ml two weeks after re-exposure to factor VIII by the administration of cryoprecipitate.

Dental extraction: Effect of prothrombin complex infusion. The effect of factor VIII and prothrombin complex infusion in the patient after undergoing dental extraction is shown in Table 3. The inhibitor was present in his blood throughout the test period. This can be seen with factor VIII infusion,

Table 3 Dental Extraction: Effect of Prothrombin Complex Infusion								
MATERIALS USED	HOSPITAL DAY							
	1	2	3	4	5	6	7	8
Factor VIII	0	+	0	0	0	0	0	0
Prothrombin Complex	0	0	0	+	+	+	+	+
EACA	+	+	+	+	+	+	+	+
Bleeding Present	0	+	+	+	0	0	0	0
EACA (Episolon aminocaproic acid, 100 mg/kg q 6 H p.o.)								
Factor VIII (50 units/kg IV)								
Prothrombin complex (50 units factor IX/kg IV)								

adequate hemostasis could not be achieved. However, subsequent to the prothrombin complex infusion, the bleeding stopped and the patient's wounds healed without complication.

Patient's clinical response to replacement therapy. A summary of the patient's overall clinical response to either factor VIII replacement or prothrombin complex infusions is shown on Table 4. With factor VIII infusion, he responded 5 of 13 times or 39% of the time, whereas with the use of prothrombin complex he had a definite clinical response in 13 of 19 infusions or 69%.

Table 4 Clinical Response with either Factor VIII or Prothrombin Complex Replacement Therapy in Patient with Inhibitor			
Bleeding Site	Factor VIII	Prothrombin Complex	
Elbow (Lf)	8	1/4	5/6
Ankle (Lf)	8	3/4	2/4
Ankle (Rt)			
Knee (Lf)	4		3/5
Knee (Rt)			
MP joint	2	1/2	1/1
Thigh hematoma	1		1/1
Tooth extract.	1	0/3	1/2
	24	5/13	13/19

DISCUSSION

Acquired circulating anticoagulants are pathological substances found in the blood which are directed against clotting factors or their reactions.^(1, 2, 3, 4, 5) In 1941, a hemophilic with an inhibitor was reported for the first time.⁽¹³⁾ In 1967, Shapiro classified the factor VIII inhibitors in four known clinical states: classical hemophilia; post-partal females; patients with various immunologic disorders; older patients in apparent good health.⁽¹⁴⁾ Practically all the factor VIII antibodies studied in children have been found in classical hemophiles.

The incidence of hemophilic patients with inhibitors to factor VIII ranges from 4 to 21%.^(1, 2, 3, 4, 5) Almost all of

these patients appear to have severe deficiency although many series included patients in whom factor VIII levels were not measured.⁽¹¹⁾ A number of investigators have shown that these inhibitors tend to show species specificity, human factor VIII being neutralized to a greater extent than factor VIII of bovine or porcine origin.^(1, 2) This has therapeutic implications since hemophiles with inhibitors have been successfully managed with bovine or porcine factor VIII, but such treatment is limited due to the development of antibodies to infused animal protein. Why patients with classical hemophilia develop inhibitors is not known. Investigators in the field suggest that at least three theories are tenable: (1) the intensity of exposure to the deficient clotting factor; (2) the presence or absence of immunoreactive factor VIII in their plasma, or; (3) the result of genetic polymorphism for normal human factor VIII.⁽¹¹⁾ It is known that the factor VIII inhibitor is a 7S gammaglobulin, that the reaction between the factor and the antibody is time dependent, and that in the absence of continual antigenic stimulation, the level falls slowly to pre-infusion levels only to reappear with exposure to the antigen similar to the secondary response one finds in re-exposure to an antigen.^(11, 2) These data have been interpreted to suggest that this is a classical antigen antibody set up and it has been suggested that patients with factor VIII inhibitors should be transfused cautiously because of the stimulatory effect factor VIII antigen has on antibody production. Previous therapeutic regimens have been directed at either overwhelming the inhibitor with massive infusions of factor VIII coagulant activity or attempting to lower the antibody concentration by various means. All these have met with unsatisfactory therapeutic results. Since the partial thromboplastin time of patients with classical hemophilia could be shortened with prothrombin complex concentrates, this suggested that it may be beneficial in treating those patients with circulating anticoagulants. It is known that these reagents contain coagulation factors II, VII, IX, and X in addition to activated intermediate products.⁽¹⁵⁾ In 1972, this approach was reported by Fekete, *et al.*⁽⁷⁾ and has subsequently been confirmed by other investigators. Our study similarly shows the efficacy of such replacement therapy in a patient with known inhibitor to factor VIII. However, the active principle or prin-

ciples in these concentrates is still not known and is presently being investigated. The guidelines for dosage used is comparable to the unit of factor IX that one would administer to factor IX deficient hemophiliacs.⁽³⁾ By following this approach, the patient in this report demonstrated clinical responsiveness and a decrease in factor VIII circulating anti-coagulant levels.

He also demonstrates that despite the low incidence of inhibitors in the hemophilic population at large, periodic screening approximately once a year should be accomplished. Before elective surgical procedures, dental extractions, or when bleeding episodes are unresponsive to proper replacement transfusion therapy, screening for an inhibitor is mandatory.

REFERENCES

1. Shapiro, S.S., Hultin, H.: Acquired inhibitors to the blood coagulation factors. *Sem in Thrombosis and Hemostasis* 1: 336-385, 1975.
2. Feinstein, D.I., Rapaport, S.I.: Acquired inhibitors of blood coagulation. *Prog in Thrombosis and Hemostasis* 1: 75-95, 1972.
3. Abildgaard, C.F.: Management of inhibitors in hemophilia. *Hemophilia in Children*, Hilgartner, M.W. (ed) 1: 171-184, 1976.
4. Strauss, H.S.: Acquired circulating anticoagulants in hemophilia A. *New Eng J Med* 281: 866-873, 1969.
5. Margolis, A. Jr., Jackson, D.P., Ratnoff, O.D.: Circulating anticoagulants: A study of 40 cases and a review of the literature. *Medicine* 40: 145-202, 1961.
6. Abildgaard, C.F.: Current concepts in the management of hemophilia. *Sem in Hematology* 12 (3): 223-231, 1975.
7. Fekete, L.F., Holst, S.L., Peetoom, F., DeVeber, L.L.: "Auto factor IX concentrate: A new therapeutic approach to the treatment of hemophilia A patients with inhibitors. Fourteenth International Congress of Hematology, Abstract #295, 1972.
8. Kurczynski, E.M., Penner, J.A.: Activated prothrombin concentrate for patients with factor VIII inhibitors. *New Eng J Med* 291: 164-167, 1974.
9. Abildgaard, C.F., Britton, M., Harrison, J.: Prothrombin complex concentrate (Konyne) in the treatment of hemophilic patients with factor VIII inhibitors. *J of Peds* 88 (2): 200-205, 1976.
10. Corrigan, J.J., Jr.: Oral bleeding in hemophilia: Treatment with epsilon aminocaproic acid (EACA) for dental extractions in hemophiliacs. *J of Peds* 80 (1): 124, 128, 1972.
11. Walsh, P.N., Rizzo, C.R., Evans, B.E., Aledort, L.M.: Epsilon-aminocaproic acid and replacement therapy. *Ann N.Y. Acad of Sci* 240: 267-275, 1975.
12. Simone, J.V., Vanderheiden, J., Abildgaard, C.F.: Semiautomatic one-stage factor VIII assay with commercially prepared standard. *J Lab & Clin Med* 69: 706-712, 1967.
13. Lawrence, J.S. and Johnson, J.B.: The presence of a circulating anticoagulant in a male member of a hemophilic family. *Trans Amer Clin Climat Assoc* 57: 223-231, 1941.
14. Shapiro, S.S.: The immunologic character of acquired inhibitors of antihemophilic globulin (Factor VIII) and the kinetics of their interaction with factor VIII. *J Clin Invest* 46: 147-156, 1967.
15. Blatt, P.M., Lundblad, R.L., Kingdom, H.S., et al: Thrombogenic materials in prothrombin complex concentrates. *Ann of Int Med* 81: 766-770, 1974.

Arizona Experience in Cytogenetics

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A laboratory's experience in medical cytogenetics is summarized. New developments have added precision in recognition and identification of chromosome abnormalities. The impact of the changes is discussed.

Introduction:

The purpose of this review is to relate our five year cytogenetics experience which was initiated shortly after the opening of University Hospital. It was soon recognized that a small volume of case analyses could not justify dedicated personnel and equipment necessary to keep abreast of advances in the field, so a move toward regionalization was undertaken through pooling of experienced workers. Regionalization largely applies to the Tucson area, although study requests are received from throughout the state as well as other states. Through regionalization a sizeable and instructive experience was developed. It should be understood that this experience does not represent the totality of cytogenetics in Arizona.

In the past five years medicine has witnessed rapid technical advances in chromosome analysis. Prior to 1972 the standard, conventional method of study allowed recognition of chromosome error syndromes slightly in excess of a dozen. These included the classic trisomies (Down's trisomy G, trisomy D and trisomy E), numerical abnormalities of sex chromosomes (Turner's and Klinefelter's), as well as a few substantial structural abnormalities (cat-cry syndrome, B short arm deletion; and Philadelphia chromosome, G long arm deletion). Figure 1, A illustrates a standard karyogram which permits recognition of only seven groups of chromosomes A through G based upon chromosome size and location of point of attachment (centromere) of the replicated units. The only method available for subclassification within groups of chromosomes was autoradiography, whereby the timing of replication served to distin-

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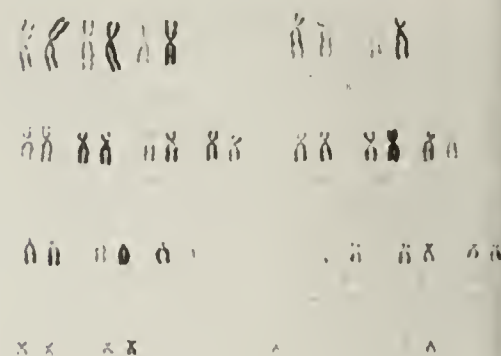


Figure 1 A

Figure 1: A is standard karyogram of normal male (46, XY). The seven groups of chromosomes A through G cannot further defined.

guish chromosome pairs which otherwise were structurally similar. This technique is time consuming and remains a research tool rather than routine procedure. Chromosome analysis prior to 1970's was not very precise.

In about 1972 several new staining techniques became available.¹⁻³ The new techniques provide distinctive characterization of each homologue pair of chromosomes—one from each parent. Generally referred to as "banding" the stained preparations fingerprint each of the chromosome homologues revealing structural conformations not apparent in standard preparations. Each of the 22 pairs of autosomes and the sex chromosomes have a distinct banded structure, and this banding pattern is identical one person to another. Not only is numerical identification of homologue chromosomes achieved, but subtle structural abnormalities can be recognized. Figure 1, B is a karyogram illustrating the application of a widely used banding technique.

Discussion:

Our experience in diagnostic cytogenetics during the past five years reflects the impact of the new technology.



Figure 1 B

B is Giemsa-trypsin banded karyogram of a normal female (46, XX). Each chromosome pair and the sex chromosomes can be numerically distinguished.

Table I summarizes the case studies from 1972 through 1976. Culturing of peripheral blood lymphocytes and inducing mitogenesis for chromosome study receives the major emphasis in cytogenetics. Intrapartum fetal chromosome analysis is gaining wide application. Search for the Philadelphia chromosome (partial deletion of long arm of number 22) is important in myeloproliferative disorders. Miscellaneous tissues occasionally subjected to study include skin, placentas, neoplasms and abortuses. "Sequential and combination" specimens refer to repeated studies of a single or multiple tissues, the latter in search for mosaicism (occurrence of more than one chromosome complement in an individual) which may not be revealed in study of a single cell line.

The results listed in Table I deserve comment. Culture failures are in part a function of technical expertise; as our experience grew, the percentage of failures diminished. Some culture failures remain in instances of immunodeficiency, contaminated specimens (e.g., abortuses), and otherwise unsatisfactory specimens.

The ratio of abnormal karyotypes detected means little since there is a considerable degree of selection for study. However, most important is the number of cases diagnosed by the new staining techniques (numbers in brackets). In the five year period 22% of abnormal cases were either partially or totally dependent upon banding for recognition or precise identification.

Table II provides data during 1976. Indications for study include the occurrence of a series of phenotypic and x-related abnormalities for which chromosome abnormalities may reasonably be considered causative or associated. A second major indication is that in search for balanced carriers in the patient's pedigree for purposes of genetic counseling. Such carriers of chromosome translocations are usually phenotypically normal themselves, but carry a risk for transmitting an unbalanced chromosome complement to their progeny.

Noteworthy in the 1976 summary is the culture success rate for amniotic fluid specimens which is higher than the national experience—a credit to the technical staff.⁵

In Table III the chromosome abnormalities are listed for the five year study. Part A consists of autosomal abnormalities, Part B sex chromosome errors and

TABLE I: ANNUAL SUMMARIES

	1972	1973	1974	1975	1976
A. Specimen					
1. Peripheral blood	184	153	122	217	238
2. Amniotic fluid		9	26	65	120
3. Philadelphia (BM & PB)	7	11	23	37	38
4. Misc. tissue	4	8	11	16	13
5. Sequential and combination			10	6	54
TOTAL	195	181	192	341	463
B. Result					
1. Culture failure (initial)	23	5	8	16	12
2. Abnormality total & (banded)	25	26(6)	37(5)	81(28)	70(16)
3. Normal	147	150	137	238	327
TOTAL	195	181	182	335	409

miscellaneous conditions. In A the abnormal chromosome is identified numerically. If the abnormality is restricted to short arms or to long arms, the symbol p or q is used, respectively. The symbol t refers to a translocation chromosome; the brackets define the translocated chromosome's composition; and t numbers without brackets refer to receptor translocation chromosomes.

states and variants. Some of the new abnormalities have been recognized as accepted syndromes (e.g., partial trisomy 9, and 13 long arm deletion).⁶ Others are one or few of a kind (e.g., 2 long arm trisomy, and isochromosome long arm 18). The horizons of medical cytogenetics have expanded widely and rapidly.

The significance of the new techniques

TABLE II: 1976 SUMMARY

	Peripheral blood	Amniotic fluid	Philadelphia chromosome	Misc. tissue	Total
A. Indications for study					
1. Clinical abnormality	154	88	38	13	293
2. Familial carrier	75	30	0	0	105
3. Research	9	2	0	0	11
					409
B. Result					
1. Culture failure	3	1	3	5	12
2. Abnormality	59	1	8	2	70
3. Normal	176	118	27	6	327
TOTAL	238	120	38	13	409
C. Ascertainment of abnormality					
1. Standard Giemsa	43	1	8	2	54
2. Banding techniques	16	0	0	0	16
					70

In part B, XO refers to the occurrence of only one sex chromosome as is characteristic of Turner's syndrome. The symbol i with brackets defines the isochromosome's composition. The entry testicular feminization, of course, is a gene defect and not a chromosomal abnormality; it is included traditionally in cytogenetics data of affected persons.

Review of Table III reveals many of the classic syndromes. In addition there are a number of new and relatively unfamiliar abnormalities. Entries in A and B1 include sixteen of the classic chromosomal abnormalities with their translocation carrier states and variants. The impact of the new staining techniques is clearly indicated by the nine entries of new abnormalities (asterisks) with their translocation carrier

lies in the recognition and identification of abnormalities not previously encountered or defined. As a group these new abnormalities are less severe clinically than the classic autosomal errors since smaller portions of chromosomes are deleted or duplicated. Of major importance is the need for accurate diagnosis and genetic counseling. Four of the nine new abnormalities listed are associated with balanced carrier states in their pedigrees. The rate of carrier association is much greater than for the classic syndromes.⁶

Together with the cytogenetics experience herein reported, we have learned of a prevailing need for services in the state and nationally. Within the past two years we have nearly reached saturation in our laboratory. There is a

TABLE III: CHROMOSOME ABNORMALITIES

	1972	1973	1974	1975	1976	TOTAL
A. Autosomes						
Chromosome & Abnormality						
*1p deletion; t(1q6p)				1		1
*2q trisomy; t(1p2q)				1		1
2q trisomy carrier				1		1
5p deletion		1		1		2
*9p trisomy; t 18 & 20			1	3		4
9p trisomy carrier				8		8
13 trisomy; t 13, 14 & 15					3	3
13 trisomy carrier					4	4
*13q deletion; t(13qXp)				1		1
*15q deletion; t(9q15q)					1	1
18 trisomy	1	1	1	6	2	11
*18q trisomy				1		1
18q trisomy carrier; t(18q21q)				2		2
*18 isochromosome; i(18q)					1	1
18 ring		1				1
*Fp deletion			1			1
21 trisomy	8	11	13	22	27	81
21 trisomy; t(14q21q)	1					1
21 trisomy carrier; t(14q21q)		3		3	2	8
21 trisomy; t(21q21q)		1		2		3
22q deletion (Philadelphia)		2	10	9	8	29
B. Sex Chromosome and Misc.						
Chromosome & Abnormality						
1. Sex Chromosomes						
XO, Turner	5	2	2	4	5	18
XO/XXX mosaic			1			1
X ring	1		1			2
X isochromosome; i(Xq)		2	1		2	5
*Xp deletion			1	2		3
Xp deletion carrier; t(16qXp)				2		2
XXY, Klinefelter	3	1	1	1	4	10
XXXXY, Klinefelter variant	1			1		2
XYY			2	2	1	5
Testicular feminization	1			4		5
Intersex, misc.	2		1	1	4	8
2. Miscellaneous						
Chimera, blood	1				1	2
Leukemic markers		1		1		2
Ataxia telangiectasia			1			1
Triploidy					2	2
Undefined aneuploidy	1				3	4
C group hypoploidy				2		2
TOTAL	25	26	37	81	70	239

*Examples of new syndromes or unique chromosomal abnormalities

shortage of service availability; additional laboratories are needed at a time of expanding interests and indications for cytogenetics study.

Acknowledgment: The valuable assistance of Edward M. Lavar, M.T., C.T. (ASCP) in cytogenetic consultation is deeply appreciated.

REFERENCES

1. Caspersson, T., L. Zeck, C. Johansson, & E. Modest. Identification of human chromosomes

by DNA-binding fluorescent agents. *Chromosoma* 30:215-227, 1970.

2. Schwarzbacher, G.H. & U. Wolf, eds, Methods in human cytogenetics, 1974, Springer-Verlag, New York.
3. Inhorn, S.L., & L.F. Meisner. Mechanisms of chromosomal banding. *Path Ann* 10:145-176, 1975.
4. Paris Conference (1971): Standardization in human cytogenetics. Birth defects: original article series. New York, The National Foundation VIII:7, 1972.
5. The NICHD Nat'l. Registry for Amniocentesis Study Group. Midtrimester Amniocentesis for prenatal diagnosis. Safety and accuracy. *J.A.M.A.* 236:1471-1476, 1976.
6. Lewandowski, R.C., & J.J. Yunis. New chromosomal syndromes. *Amer J Dis Child* 129:515-529, 1975.

Impact of Computerized Tomography in Medical Practice

Cost-Effectiveness Considerations

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Little more than three years ago the early cerebral studies produced by Computerized Tomography (C.T.) became available in the United States. Called E.M.I. scans initially, for the company which first marketed the scanning device, the new technique was heralded as a breakthrough comparable to the discovery by Roentgen of X rays in 1895. Today, in a short time probably without precedent in the history of medical technology, the use of C.T. scanning has become virtually universal. Not only has it lived up to the highest expectations but it has truly revolutionized the practice of medicine in general and neurology in particular.

A non invasive procedure, practiced without risk or discomfort to the patient, C.T. scanning produces cross-sectional images of the brain where anatomical structures and pathological lesions are readily identified. This information is obtained with a small dose of radiation comparable to that of a skull X ray examination. The concept of its operation is simple: Thousands of X ray absorption readings can be taken in seconds or minutes within a single plane, by X ray beam and coupled detectors rotating around the head. This information is processed by a computer which calculates an absorption value for each point in the scanning plane. These values are relative coefficients of absorption compared with water and can be displayed as a function of brightness in a television image.

This information is very reliable and easily obtained. Comatose patients

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ing admitted to the emergency room a hospital may be scanned within minutes of arrival. Critically ill patients in hospitals where the new test is not available, are often transferred via ambulance to obtain such a scan because the information thus obtained is deemed vital for the management of the patient. Physicians in rural towns of Arizona may need to send patients at times traveling hundreds of miles, to the nearest city where C.T. scanning is available. Ambulatory patients being worked up for head trauma, seizures or simple headaches may obtain the test as an outpatient, thus avoiding the inconvenience and expense of hospitalization and often times the more invasive neuroradiological procedures.

The popularity of the new diagnostic test has been so explosive and its demand is growing so fast that it must arm cost-effectiveness conscious health planning officials and insurance company officials alike. There are many legitimate questions that have to be answered: Is the test, requiring high initial capital investment all that important in patient management? Are we witnessing a temporary fad? In other words: Are physicians ordering the test just because it is a fancy expensive new thing available on the market? Should costs be imposed? What percentage of negative studies can we accept before concluding that the test is being ordered indiscriminately? How large should a referral population be before the purchase of this expensive equipment can be justified?

Some of these latter questions cannot be adequately answered until the data being rapidly accumulated can be collected and properly analyzed. As for the special importance of the diagnostic tool, we will attempt to show its value in a small series of case histories selected representative, because C.T. scanning is vital in the management of the patient, or in consideration of medico-legal implications. It may well be that once all the cost efficiency studies are completed we will have to conclude that a saved life is worth any price no matter how high. Yet, it will probably be shown that the savings are significant not only in lives but also in hospitalization costs.

CASE HISTORIES

Case 1—Metastatic Tumor vs Malpractice:

A sixty year old married male was referred by an attorney. He had lobar resection of the left lung for bronchio-

genic carcinoma, nine months prior to admission. Surgery was followed by cobalt radiation to the left hilar and supraclavicular lymph nodes over a five week period. Four months later he developed numbness of the right hand which had progressed to clumsiness in that hand. He denied symptoms referable to the leg, headaches or other common neurological complaints. He had been seen by another neurologist who had suggested the possibility of radiation myelitis. The patient had then remembered an incident in which the technician delivering the therapy had apparently made a mistake in the portal of radiation and this incident prompted him to seek advice from the referring attorney. On examination there was a mild right hemiparesis with a decreased right corneal reflex. Admitting diagnosis was left cerebral metastatic disease. He underwent a complete workup consisting of electroencephalogram, radioisotopic brain scan, bone scan, skull X rays, lumbar puncture and bilateral carotid arteriograms. Each single test performed was normal or inconclusive. An outpatient C.T. scan however, two days after discharge, showed at least two metastases (Figure 1) prompting a course of whole head radiation.

Comment: Early diagnosis of cerebral metastasis at a time in which angiography and other tests were still negative allowed for early institution of treatment and the possibility of better prognosis. It also aborted unjustified legal intervention. Had a C.T. scan been obtained first, hospitalization and diagnostic costs in excess of \$2,000.00 could have been avoided.

Case 2—Atrial Fibrillation and Cerebral Embolization:

A 47 year old married woman collapsed at the office where she was employed and became unresponsive because of sudden onset of right hemiplegia and aphasia. Rushed to the hospital she was found to have atrial fibrillation and a diagnosis of embolization to the left middle cerebral artery secondary to atrial fibrillation was made. During her hospitalization, she showed progressive improvement of mental status with ability to answer questions as yes or no, she was normotensive and the atrial fibrillation reverted to normal sinus rhythm with digitalization. No anticoagulation therapy was used. On the ninth day of hospitalization a C.T. scan showed changes compatible with a hemorrhagic infarction and a clot

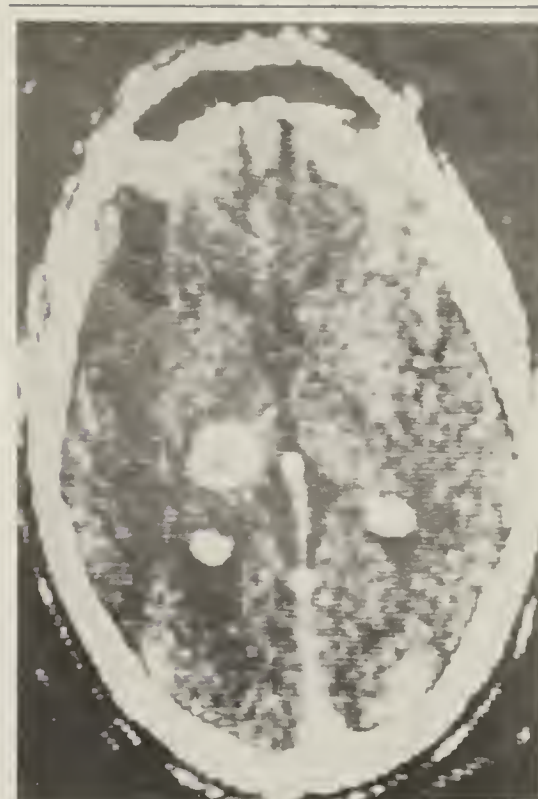


Figure 1: The round tumor mass in the left hemisphere is one of the two metastases shown with contrast enhancement. The smaller two white structures are the choroid plexuses.

within the left hemisphere (Figure 2). Twelve days after the stroke the patient showed progressive deterioration becoming unresponsive except for decerebration in the right side to deep pain, indicative of early herniation. She was taken to surgery and the clot was removed with prompt postoperative im-

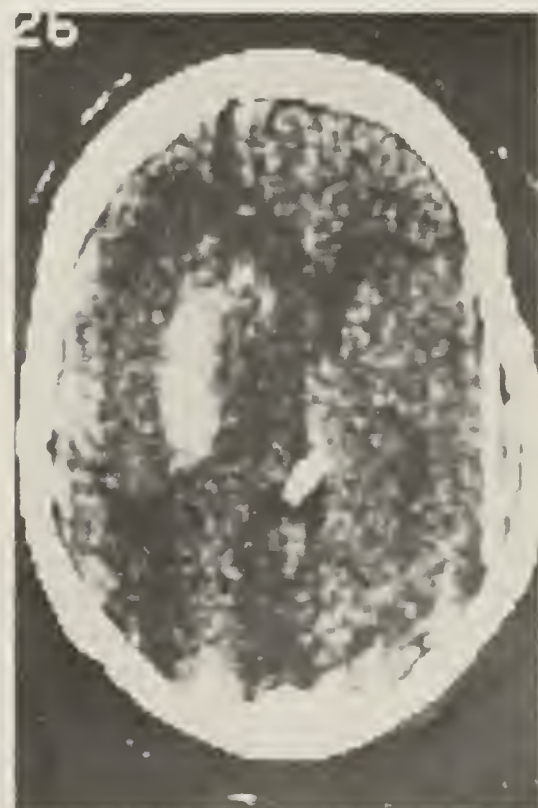


Figure 2: Clot shown as a white mass in the left hemisphere, without contrast enhancement. There is cortical hemorrhage and severe swelling of the left side, causing left to right shift of the midline.

provement in level of consciousness. Six months postoperatively, the patient is at home, fully ambulatory and able to communicate well with some resolving expressive aphasia and monoplegia of the right arm as the only severe deficit.

Comment: Surgery, which saved the patient's life, would never have been an available option in a case of hemorrhagic infarction secondary to embolization had it not been for the C.T. scan that showed a clot as distinct from the surrounding hemorrhagic infarct. Cerebral angiography and radionuclear scanning were not obtained.

Case 3—Coma Vigil Following Bilateral Strokes:

A 58 year old woman visiting Arizona was admitted because she developed numbness in the right side and aphasia. She was known to be hypertensive and had suffered a minor transient ischemic attack one week prior to admission. During the first four days of her hospital stay she remained quite alert but showed no significant change in her neurological condition. She then developed sudden increase in blood pressure and was transferred to the intensive care unit where overnight, she developed paresis of the left side and a state of coma vigil. In this state she would open the eyes, appear to look around with non purposeful movements of the eyes and responded with partial decerebration to painful stimuli. The C.T. scan showed a massive infarction of most of the left hemisphere and infarction of the right frontal lobe. (Figure 3). She died two days later and an autopsy confirmed the extent of the cerebral lesions.

Comment: Recognition of the extent of the lesions which is incompatible with recovery of consciousness, provided accurate information in discussing the prognosis with the patient's husband and children. It allowed them to become part of the medical team in the decision making process and prevented the institution of therapeutic measures which might have kept the patient in a vegetative state for a prolonged period of time.

Case 4—Industrial Accident vs. Stroke:

A 42 year old male was seen at the request of his attorney three and a half years after having struck his head at work. He had a protective hard hat and did not lose consciousness although he

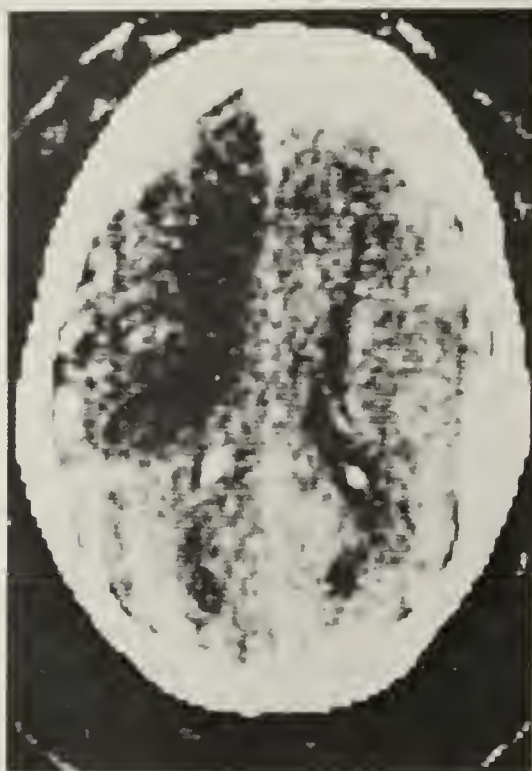


Figure 3: Massive destruction of the anterior $\frac{2}{3}$ of both hemispheres shown as a lucency. There is better delineation on the left side because it is an older lesion.

was dazed. Several hours later he developed a headache. Two days later he had transient weakness of the right arm which cleared in a few seconds. Subsequently, on the evening of the same day, he developed numbness and weakness of the right arm with speech difficulty progressing to hemiplegia. Admitted to another hospital he underwent cerebral angiography which was reported to show a subdural collection. Taken to surgery, the neurosurgeon reported evacuation of 30 cc of fresh blood from the subdural space. Postoperatively, the patient remained hemiplegic and aphasic. A second neurosurgeon had at the request of the employer, examined the patient at a later date. After reviewing the angiograms he arrived at the conclusion that there was no evidence of subdural hematoma and suggested that the patient had suffered a stroke secondary to a high degree stenosis seen in the left middle cerebral artery in the arteriogram. On examination the patient had severe right spastic hemiparesis and mixed expressive and receptive aphasia which was considered to be a fixed deficit. C.T. scan showed an old infarction in the area of the left middle cerebral artery territory (Figure 4).

Comment: Although the angiogram had shown the stenotic lesion, this in itself was not unequivocal evidence of the presence of infarction. The demonstration of an infarct by C.T. scan on the

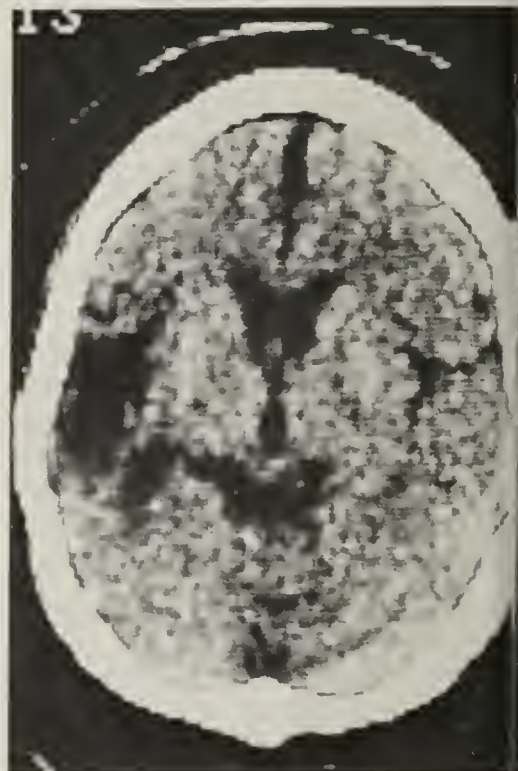


Figure 4: Sharply delineated lucency an infarct in the left hemisphere. The infarct extended throughout the territory of the middle cerebral artery in all tomographic scans.

other hand, provided the definite information needed by the two litigant parties with conflicting expert witness reports, to arrive at a fair settlement and avoid further litigation costs.

Case 5—Intraventricular Hemorrhage. Always Fatal?

A 37 year old male involved in a brawl at a bar in a border town, was subdued by the local police and thrown in jail after being hit on the head. The following morning he was found comatose and was transferred to a local hospital. Brought to Tucson by ambulance three days later he was in deep coma and responded to pain with bilateral decerebration. He had obvious signs of brain stem damage with bilateral gaze palsies and absent oculocephalics. There was marked neck stiffness. Spinal fluid showed grossly hemorrhagic cerebrospinal fluid under elevated pressure. Bilateral carotid angiograms showed enlarged ventricles and lateral deviation of the lenticulostriate arteries on the right. C.T. scan demonstrated hemorrhage in the right basal ganglia with extension into the ventricular system (Figure 5a). The fourth ventricle was massively distended with blood. He was aggressively treated with repeated lumbar punctures to drain the blood from the ventricles, and massive antibiotic therapy for extensive bilateral bronchopneumonia.

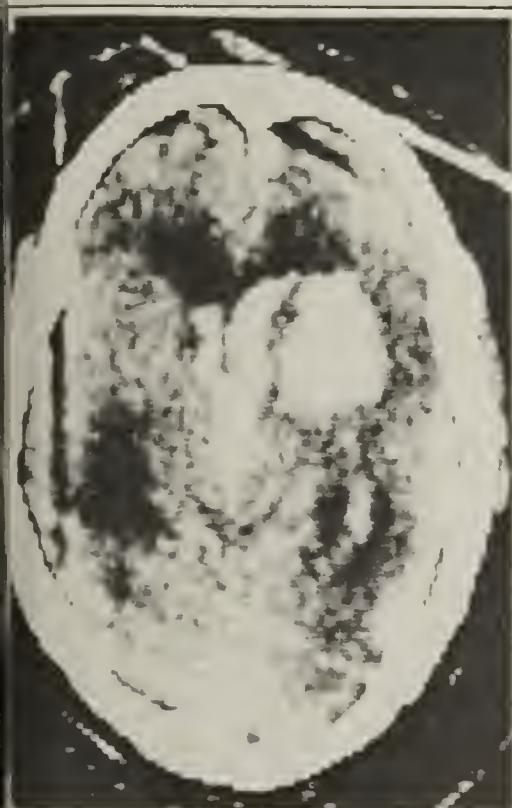


Figure 5a: White hemorrhage on the right, captured into the ventricular system. The third ventricle in the midline is massively distended with blood.

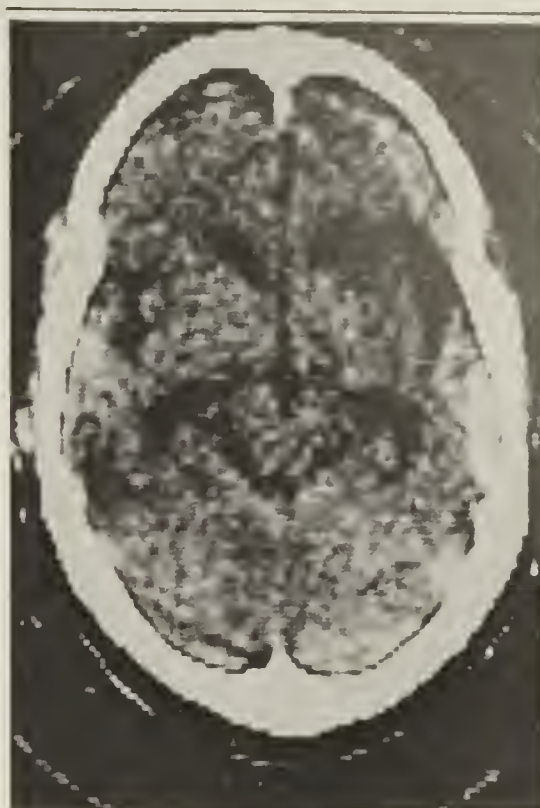


Figure 5b: Same patient as 5a, six weeks later. Resolution of hemorrhage with residual damage to the right frontal lobe seen as a lucent, slit shaped cavity.

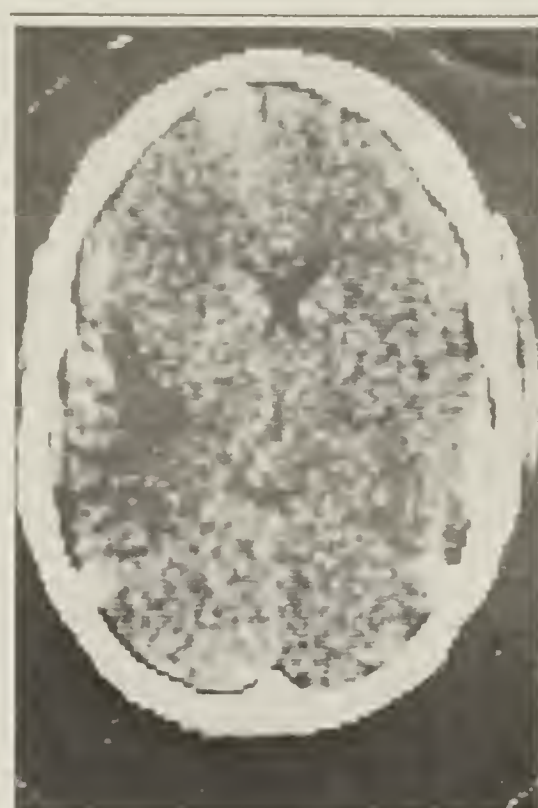


Figure 6: Swelling of the left hemisphere with compression of the left frontal horn and lucency in the temporal lobe consistent with edema. There is focal cortical hemorrhage.

Two weeks later he opened his eyes and was able to communicate with relatives. He was discharged after six weeks of physical therapy, walking with the aid of a walker. He was mildly demented and had bilateral gaze palsies. A follow-up C.T. scan (Figure 5b) showed restoration of the ventricular size and resolution of the hemorrhage. At his last examination, eight months after the trauma, he had a normal mental status, homophobia in extreme lateral gaze due to old residual sixth nerve weakness and imperfect motor coordination. He was actively engaged in a family business making jewelry and no longer frequented bars.

Comment: The presence of decerebration and brain stem signs in massive intracerebral hemorrhage has been interpreted by neurologists in the past as indicating cerebral herniation with secondary brain stem hemorrhages which are incompatible with life. Demonstration by C.T. scan of an intact brain stem and relatively little cerebral damage other than the focal hemorrhage in the non dominant hemisphere and a dilated ventricular system flooded with blood, prompted us not to lose hope and fight for this patient's life. This and similar cases of intraventricular hemorrhage have been treated successfully by repeated lumbar punctures or by ventricular drainage since the advent of C.T. scanning.

Case 6—Trauma and Bizarre Behavior:

An 18 year old University of Arizona debate student was involved in a motor vehicle accident. She sustained closed head trauma without loss of consciousness. X rays revealed a linear parietal occipital skull fracture on the left and a fracture of the right clavicle. Admitted to the Trauma Service she was evaluated by a Psychiatrist because of agitation, disorientation, combativeness, and profane language. Diagnosed of acute brain syndrome secondary to trauma, a Neurological consultation was requested on the third day of hospitalization. At that time she had specific signs of dysphasia, inability to follow commands, left to right disorientation, finger agnosia, poor calculation ability and poor recent memory. C.T. scan demonstrated focal cortical hemorrhages in the left temporal lobe with edema spreading into the hemisphere and left to right shift (Figure 6). She recovered within the next several weeks. Three months later she was able to participate in a national speech contest without noticeable difficulty.

Comment: Not only was it important to determine the extent of damage to the speech area in this student, but the presence of focal findings after trauma would have required cerebral angiography to rule out a hematoma had C.T. scanning not been available. Cerebral

angiography is more dangerous and a costlier procedure, in addition it does not differentiate with certainty between intracerebral hematoma and an avascular mass due to edema.

Case 7—Nausea and Headache Following Trauma:

A 13 year old boy from a rural community had been hit on the side of the head while playing. He was not unconscious but nevertheless he was admitted to a hospital for observation. Skull X rays were normal. Because of persistence of headache and nausea he was transferred to Tucson, four days after the initial trauma. Neurological examination was negative. There was no papilloedema. C.T. scan performed at the time of admission revealed a large epidural hematoma (Figure 7). The patient was taken directly into the operating room where a craniotomy and removal of the clot was performed within two hours of arrival. At surgery a fronto-temporal fracture not seen in regular X-rays was noticed. The patient was discharged home asymptomatic five days after admission.

Comment: An epidural hematoma often presents with a lucid interval. This is because the clot is contained between the skull and the dura that protects the underlying brain. When the dura collapses due to building pressure, the neurological deficit is often catastrophic with rapid progression to coma and ir-



Figure 7: Biconvex, lenticular hematoma on the left side, characteristic of an epidural hematoma. Note left to right shift of the frontal horns. There is impending herniation.

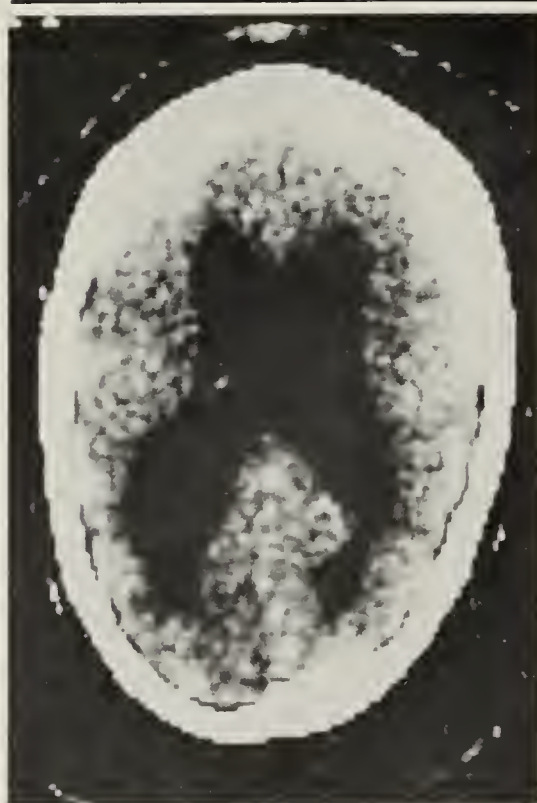


Figure 8a: Severe bilateral hydrocephalus. Lower cuts showed equally dilated third and fourth ventricles, consistent with communicating hydrocephalus.

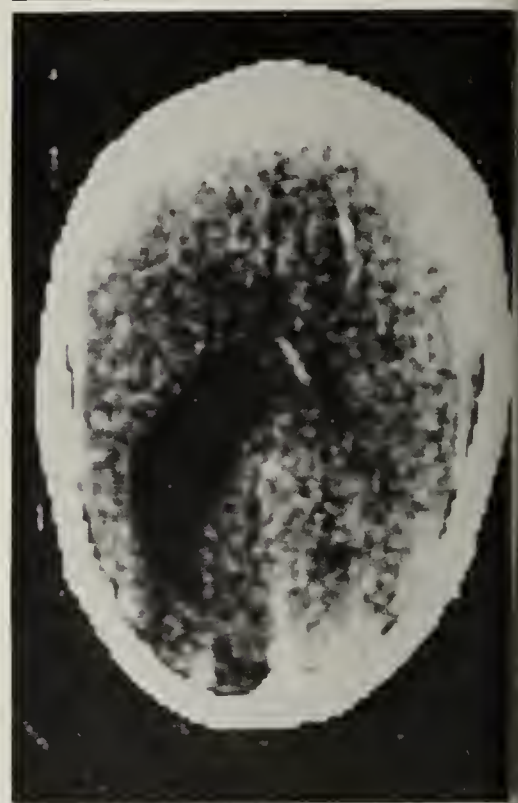


Figure 8b: Status postshunting. Note resolution of hydrocephalus with loculation of the posterior half of the left lateral ventricle.

reversible damage to the brain due to herniation. During the four days this boy was being held in observation, he was in critical danger of suffering such a fate. Fortunately the dura did not collapse. Had a C.T. scan been obtained earlier, this danger would have been unnecessary and four days hospitalization costs could have been saved. Cerebral angiography was not performed.

Case 8—Spells of Dizziness, Nausea and Vomiting for 6 Months:

This 52 year old male from a small town had seen numerous doctors and was hospitalized on three occasions within a six month period because of bouts of vomiting associated with dizziness. Several gastrointestinal work-ups had been normal. He did not have headaches or other common neurological complaints. He described some retroauricular discomfort on the left. On examination questionable cerebellar findings and minimal reflex asymmetries were noted. Both plantar responses were normal. Outpatient audiograms, skull X rays and electroencephalogram were normal. C.T. scan (Figure 8a) showed occult communicating hydrocephalus which prompted hospitalization and lumbar puncture disclosing an unsuspected chronic meningitis, probably cryptococcal. The etiology of meningitis, still active, has not been elucidated. It was elected to treat the hydro-

cephalus with a right ventricular shunt.

Four weeks later because of recurrence of symptoms a follow-up C.T. scan showed loculation of the occipital and temporal horns of the left lateral ventricle (Figure 8b) with resolution of hydrocephalus on the right side. The new findings allowed a second shunt to be placed on the left side to prevent possible herniation due to unilateral mass effect.

Comment: Unsuspected findings such as hydrocephalus in this patient, justifies ordering a C.T. scan in any patient with cerebral or cranial nerve symptoms despite absence of hard findings in neurological examination. This case also exemplifies the usefulness of follow-up C.T. scans in the management of hydrocephalus. Medical expenses and discomfort incurred by the patient during six months of illness, before a definite diagnosis was made by C.T. scan, were considerable.

Case 9—Subjective Weakness of One Foot:

A 52 year old woman complained of light unsteadiness and a tendency for the left foot to drag or for a limp to develop favoring the left leg after exercise or when she was particularly tired. She had noticed this symptom for two or three months. She had not noticed any difficulty with the left arm. On examination there was no definite objective deficit and only questionable mild asym-

metries of strength. Reflexes in the lower extremities were active and equal and both plantar responses were flexor and equal. Skull X rays were normal. Because of the patient's apparent reliability, a C.T. scan was obtained. It showed a parasagittal meningioma (Figure 9) high in the convexity. The patient was admitted to the hospital for cerebral angiography and craniotomy with complete removal of the tumor. She went home nine days later without any postoperative deficit.

Comment: Meningiomas are essentially benign tumors but early diagnosis and surgery clearly improves postoperative results. Patients with neurological symptoms and absence of findings should obtain a C.T. scan with the same readiness that patients with pulmonary symptoms obtain a chest X ray, as a first step in the work up.

DISCUSSION

C.T. scanning is not just a diagnostic tool that shows cerebral lesions better and more easily than other techniques. In the preceding case histories we have attempted to show how C.T. scanning is changing the practice of neurology of medicine at large. Some of the areas which have benefited most from the technique are cancer with intracranial metastasis (Case 1), intracerebral hemorrhage (Case 2 and 5), management of coma (Cases 3 and 5), craniocerebral



Figure 9: High convexity tomographic scan shows a round mass on the right side with dense contrast enhancement and density of the adjacent white matter due to edema.

trauma (Cases 6 and 7) and hydrocephalus (Case 8).

It is perhaps in the area of head trauma, an everyday occurrence in an emergency room, that the gain is more obvious and where savings, both in lives and hospitalization costs are most dramatic. Until now it has been accepted standard of good medical care to hospitalize for observation, patients of all ages who have sustained significant craniocerebral trauma, with or without loss of consciousness. This observation, however, has been at best blind because we had no reliable way of knowing if a complication such as a hematoma was present until signs of cerebral damage or coma developed. Fortunately, most patients do not develop such complications and are discharged home after three or four days of observation. At overall hospitalization costs, ever increasing and running in the neighborhood of \$200.00 a day at the present time, we have paid a very dear price for such an ineffective observation. Those hospitalization costs alone, if added, could buy C.T. units for every emergency room in a relatively short period of time.

Wortzman and coworkers in a cost effectiveness evaluation published in the October, 1975 issue of Radiology, reviewed 203 sequential clinical inpatient records at the Toronto General

Hospital and data on 241 outpatient workups. The calculated savings affected by C.T. scanning in hospitalization costs and neuroradiological procedures such as cerebral angiography and pneumoencephalography which would have been performed had the technique not been available. In their study they found that a single C.T. unit can effect savings up to \$2,000,000.00 per year.

At Tucson Medical Center where the first C.T. unit in the area has been in operation since mid 1975, we reviewed the records of the first 15 months of its operation and compared the number of neuroradiological procedures performed in that time with those done in the immediately preceding 15 months. In this period of time, for a total of 30 months surveyed, the number of cerebral angiograms dropped from 503 in the first 15 months to 278 since the C.T. unit started operating. Pneumoencephalograms were performed at a rate of 100 per year and only 20 have been done since. When we looked into the number of radionuclide brain scans performed, we found that 1,617 studies were done in the 12 month period between July, 1974 and June, 1975 versus only 108 studies between 1975 and 1976.

Calculating just the cost of those studies that were not performed because of C.T. and considering that cerebral angiography adds an average of two days in hospitalization costs while pneumoencephalography adds three to the average bill of a neurological workup, the savings for the 15 month period amount to about \$600,000.00 at TMC, in tests alone. This figure is only the tip of the iceberg since we have not calculated how many other hospitalizations were averted. We have not taken into consideration an increase in patient population as well as an increase in the neurology-neurosurgery attending staff at the hospital and the C.T. unit has been serving five other hospitals in the community.

We find that there is no reason for alarm by Health Planning officials regarding escalating medical costs due to C.T. and the savings are significant. Announcement of restrictions for payment of cranial C.T. scans by one of the largest insurance carriers in Arizona, on the other hand, is not only an intrusion on the patient's right to receive optimal medical care but a policy not supported by cost effectiveness considerations.

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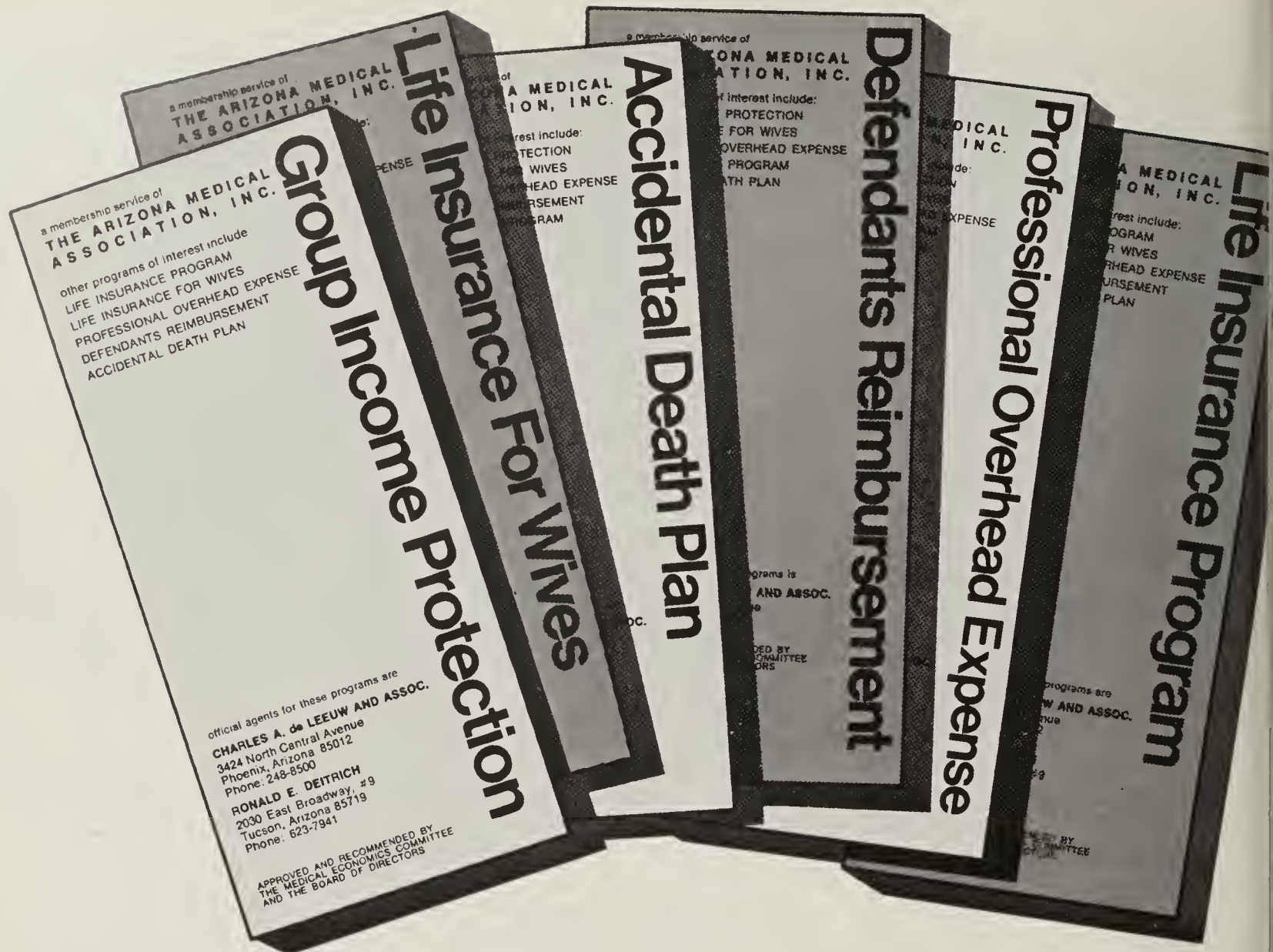
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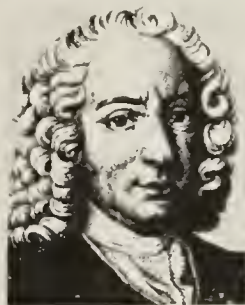
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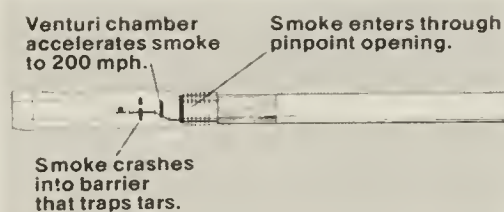
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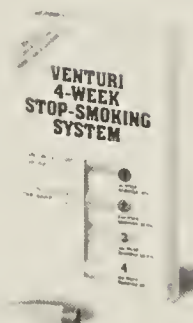
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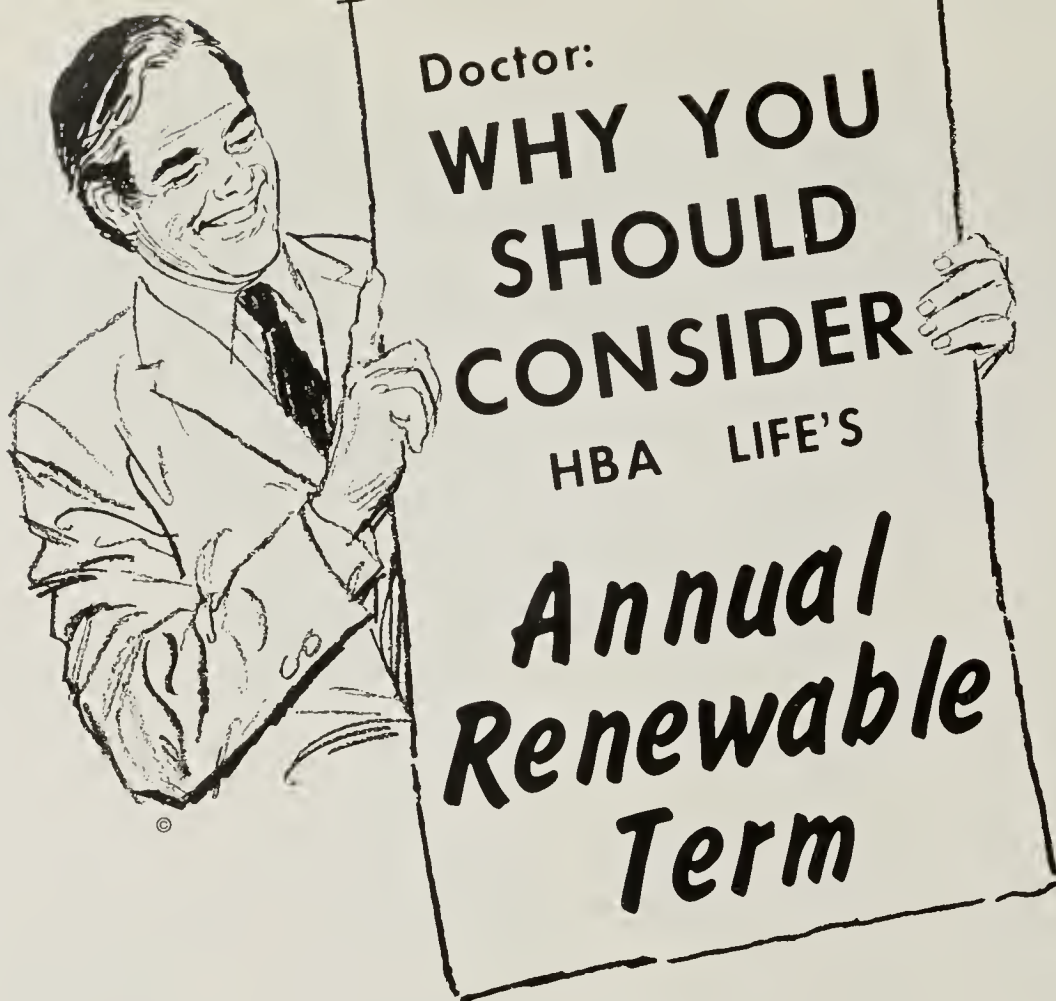
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CONTINUING MEDICAL EDUCATION ACTIVITIES SPONSORED BY THESE INSTITUTIONS RECEIVE CATEGORY 1 CREDIT FOR THE ARMA CERTIFICATE IN CONTINUING MEDICAL EDUCATION AND THE AMA PHYSICIANS RECOGNITION AWARD

JULY

ATHOPHYSIOLOGY OF HYPERTENSION

July 11, 1977, Phoenix General Hospital Phoenix, AZ. Sponsor: Phoenix General Hospital Staff Meeting. Contact: Dr. Ramon Alba, 6528 W. Indian School Rd., Phoenix, AZ. Approved for two required hours toward the ArMA Certificate in Continuing Medical Education.

OCTOBER

5th ANNUAL MEETING OF THE MEDICAL SOCIETY OF THE UNITED STATES AND MEXICO

October 12-15, 1977, Del Webb's Towne House, Phoenix, AZ. Sponsor: Medical Society of the United States and Mexico. Contact: Lucy Vernetti, M.D., 333 W. Thomas Rd., Ste 207, Phoenix, AZ 85013. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

JANUARY 1978

PEDIATRIC UPDATE 1978

January 16-19, Doubletree Inn, Scottsdale, AZ. Sponsor: Dept. of Pediatrics of St. Joseph's Hospital and Medical Center, Phoenix, AZ. Contact: Melvin L. Cohen, M.D., Dept. of Pediatric Education, St. Joseph's Hospital and Medical Center, 350 W. Thomas Road, Phoenix, AZ 85013. Approved for 16 required hours toward the ArMA Certificate in Continuing Medical Education and A.A.F.P. credits.

MONTHLY OR WEEKLY

OFFICE PSYCHIATRY FOR THE PRIMARY PROVIDER

Monday of month, 4811 N. 7th Street, Phoenix, AZ. Sponsor: Arizona Health Plan. Contact: T. R. Bittker, M.D., Box 5000, Phoenix, AZ 85010. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

Do you have patients with Paget's Disease of Bone?



You can get updated information on the disease and on effective treatment for its symptoms of bone pain, skeletal deformities, and neurologic deficits.

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- ☐ Send latest information on Paget's Disease of Bone.
☐ Have your representative call on me.

Dr. _____

Address _____

City _____ State _____ Zip _____

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Society. Contact: Mrs. Mary Wood, 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 2 required hours per session toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tucson Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine & Dept. of IM, Dermatology Sect. Contact: Peter Lynch, M.D., U of A College of Medicine, Tucson, AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U of A College of Medicine, Dept. of Internal Medicine, Clinical Immunology Section. Contact: John Boyer, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd & 5th Thursday — Rm. N318, VA Hospital, 2nd & 4th Thursday, Rm. 6505, Tucson Medical Center. Sponsor: U of A College of Medicine, Department of Internal Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th Tuesdays — Rm. 6505, AZ Medical Center. 2nd & 4th Tuesdays — Rm. N318, Veterans Adm. Hospital. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Sidney Salmon, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

GRAND WARD ROUNDS — TRAUMA

Every Tuesday, 8 a.m. Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Surgery Dept., Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room 4410, Arizona Medical Center, Tucson, AZ. Sponsor: Division of Ophthalmology, U of A College of Medicine. Contact: H. E. Cross, M.D., Ph.D., Arizona Medical Center, Dept. of Surgery, Tucson, AZ. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd, & 5th Wednesday — Staff Conf. Rm., VA Hospital. 2nd & 4th Wednesday — Rm. 5403, Arizona Medical Center. Sponsor: U of A College of Medicine, Dept. of Internal Medicine. Contact: Jay Smith, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm. 8403, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine Dept. of Psychiatry. Contact: Alan Levenson, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 1/2 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona Medical Center, Tucson, AZ. Sponsor: U of A College of Medicine, Dept. of Surgery, Trauma Section. Contact: Martin Silverstein, M.D., U of A College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State Hospital, Phoenix, AZ. Sponsor: Arizona State Hospital. Contact: Howard E. Wulsin, M.D., Arizona State Hospital, 2500 E. Van Buren, Phoenix, AZ 85008. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

SURGICAL GRAND ROUNDS

4TH TUESDAY OF EACH MONTH
Hospital Auditorium, Baptist Hospital, Phoenix. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 6036 N. 19th Ave., Phoenix, AZ 85015. Approved for 1 1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE

Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CAMELBACK HOSPITAL CLINICAL CONFERENCE

Third Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

COUNTER TRANSFERENCE GROUP

Weekly, Thurs. 8-10 p.m. Sponsor: Phoenix Psychiatric Council. Contact: James I. Campbell, M.D., 5051 N. 34th St., Phoenix, AZ 85018. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DESERT SAMARITAN HOSPITAL

Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Rosati, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS

Mondays — 12 Noon. D-5 North Conference Rm., Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE

3rd Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 926 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

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Hearing losses are among the most consistently neglected health problems. Many people with them won't even admit it to themselves, let alone others. A little encouragement may start them thinking about themselves more realistically.

That's why we're offering you the poster shown here. You can hang it on the wall or stand it on a small table. It comes with booklets called "As precious as sight" that give your patients some basic facts about auditory testing and hearing losses and how easy they are to correct in many cases.

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Each tablet contains 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl.

FOR THE PAIN

- Quickly relieves painful symptoms such as burning and pain associated with urgency and frequency
- Recommended antibacterial therapy up to 3 days with Azo Gantanol then 11 days with Gantanol (sulfamethoxazole)

Before prescribing, please consult complete product information a summary of which follows:

Indications: In adults, urinary tract infections complicated by pain (primarily pyelonephritis, pyelitis and cystitis) due to susceptible organisms (usually *E. coli*, *Klebsiella*, *Aerobacter*, *Staphylococcus aureus*, *Proteus mirabilis* and, less frequently, *Proteus vulgaris*) in the absence of obstructive uropathy or foreign bodies.

Note: Carefully coordinate *in vitro* sulfonamide sensitivity tests with bacteriologic and clinical response; add aminobenzoic acid to follow-up culture media. The increasing frequency of resistant organisms limits the usefulness of antibacterials including sulfonamides. Measure sulfonamide blood levels as variations may occur; 20 mg/100 ml should be maximum total level.

Contraindications: Children below age 12; sulfonamide hypersensitivity, pregnancy at term and during nursing period, because Azo Gantanol contains phenazopyridine hydrochloride it is contraindicated in glomerulonephritis, severe hepatitis, uremia, and pyelonephritis of pregnancy with GI disturbances.

Warnings: Safety during pregnancy not established. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been reported and early clinical signs (sore throat, fever, pallor, purpura or jaundice) may indicate serious blood disorders. Frequent CBC and urinalysis with microscopic examination are recommended during sulfonamide therapy.

Precautions: Use cautiously in patients with impaired renal or hepatic function, severe allergy, bronchial asthma, in glucose-6-phosphate dehydrogenase deficient individuals in whom dose-related hemolysis may occur. Maintain adequate fluid intake to prevent crystalluria and stone formation.

Adverse Reactions: Blood dyscrasias (agranulocytosis, aplastic anemia, thrombocytopenia, leukopenia, hemolytic anemia, purpura,

FOR THE PATHOGENS

- Effectively controls susceptible pathogens such as *E. coli*, *Klebsiella*, *Aerobacter*, *Staph. aureus*, *Proteus mirabilis* and, less frequently, *Proteus vulgaris*.

*unobstructed due to susceptible organisms

hypoprote thrombinemia and methemoglobinemia), allergic reactions (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis), GI reactions (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis), CNS reactions (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia), miscellaneous reactions (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. Usual adult dosage: 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

NOTE: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

Supplied: Tablets, red, film-coated, each containing 0.5 Gm sulfamethoxazole and 100 mg phenazopyridine HCl—bottles of 100 and 500.



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Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* WARNING

This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with

cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K⁺ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K⁺ intake. The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy. Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spiro-lactone is used concomitantly, determine serum K⁺ frequently; both can cause K⁺ retention and elevated serum K⁺. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium[®] (triamterene, SK&F Co.), and

leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

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TUMOR BOARD CONFERENCE

Every Friday at Noon, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Phoenix Memorial Hospital. Contact: Edward Kimball, M.D., 333 West Thomas Road, Phoenix, AZ 85013. Approved for credit toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Third Monday of the Month, 6:30 p.m., Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS

Last Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U of A Medical Center, Dept. of Radiology. Contact: Irwin J. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE

1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MORBIDITY & MORTALITY CONFERENCE

2nd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CLINICAL PATHOLOGICAL CONFERENCE

3rd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

GRAND ROUNDS

Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Sponsor: Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Century Medical Plaza, Suite 160, 1701 West St. Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.

GI CONFERENCE

(Special Program with U of A Consultants) 4th Friday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

G.I.-RADIOLOGY CLINICAL CORRELATION CONFERENCE

1st and 3rd Monday, 1 p.m. - C435. Sponsor: VA Hospital, Phoenix, AZ. Contact: Jasper L. McPhail, M.D., Veterans Administration Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

GASTROENTEROLOGY CONFERENCE

1st and 3rd Tuesday, 1 p.m. - T-5. Sponsor: VA Hospital Phoenix, Contact: Jasper L. McPhail, M.D. VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

2nd Thursday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CLINICOPATHOLOGY CONFERENCE

4th Thursday of 3rd Mo. (Mar., Jun., Sept & Dec.), 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Education.

MEDICAL-SURGICAL CHEST CONFERENCE

1st and 3rd Thursday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CANCER SYMPOSIUM (formerly Tumor Board)

Each Wednesday - 1 p.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

SURGERY-PATHOLOGY CONFERENCE

Each Thursday - 7 a.m. - 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CONFERENCE

1st, 2nd & 3rd Wednesday. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL SERVICE GRAND ROUNDS

Each Friday - 11 a.m. - T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

HEPATOLOGY CONFERENCE

2nd and 4th Tuesday - 1 p.m. - 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

UROLOGY-PATHOLOGY CONFERENCE

Each Wednesday - 7 a.m. - 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

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1. _____		
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3. _____		
4. _____		

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Full tuition fee of \$ _____ is enclosed at \$60 per registrant. Tuition includes course materials and luncheon and **MUST ACCOMPANY THIS FORM**. (There is a \$10 handling fee deducted on all refunds for cancellations received at least one week in advance of course; no refund thereafter.)

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Physician needed to head detection and diagnostic sections of community-based Cancer Control Program in New Mexico and the Navaho nation. Will establish and supervise rural clinics. Should have a sensitivity for and desire

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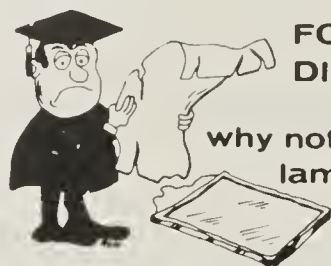
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CLINICAL PATHOLOGY

DIAGNOSTIC X-RAY

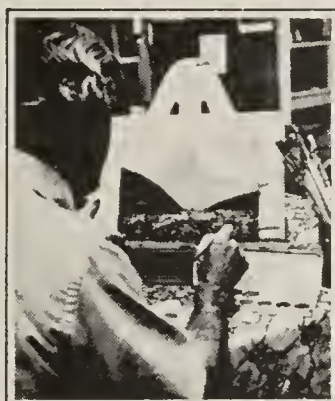
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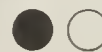


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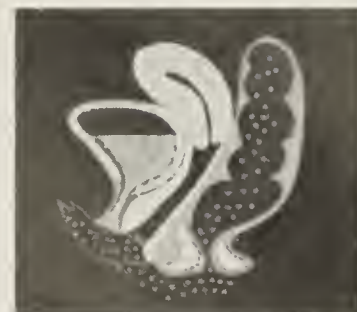
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For recurrent attacks of urinary tract infection in women

Bactrim™ DS Double Strength Tablets

Each tablet contains 160 mg trimethoprim and 800 mg sulfamethoxazole.

Just one tablet b.i.d. for 10 to 14 days



- Action at urinary/vaginal/lower bowel sites helps eliminate reservoirs of infecting organisms
- Distinctive antibacterial action plus wide spectrum helps eradicate recurrent UTI
- Low incidence of bacterial resistance in community practice

- Convenient *b.i.d.* dosage provides day-and-night antibacterial control
- Contraindicated during pregnancy and the nursing period. During therapy, maintain adequate fluid intake; perform CBC's and urinalyses with microscopic examination.

Before prescribing, please consult complete product information, a summary of which follows:

Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. **It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination.** Note: The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

Also for the treatment of documented *Pneumocystis carinii* pneumonitis. To date, this drug has been tested only in patients 9 months to 16 years of age who were immunosuppressed by cancer therapy.

The recommended quantitative disc susceptibility method (*Federal Register*, 37:20527-20529, 1972) may be used to estimate bacterial susceptibility to Bactrim. A laboratory report of "Susceptible to trimethoprim-sulfamethoxazole" indicates an infection likely to respond to Bactrim therapy. If infection is confined to the urine, "Intermediate susceptibility" also indicates a likely response. "Resistant" indicates that response is unlikely.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; pregnancy; nursing mothers; infants less than two months of age.

Warnings: Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. **Blood dyscrasias:** Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. **Allergic reactions:** Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. **Gastrointestinal reactions:** Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea and pancreatitis. **CNS reactions:** Headache,

peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. **Miscellaneous reactions:** Drug fever, chills, toxic nephrosis with oliguria and anuria, periarthritis nodosa and L. E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age.

Urinary Tract Infections: Usual adult dosage—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days.

Recommended dosage for children—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. A guide follows:

Children two months of age or older

Weight		Dose—every 12 hours	
lbs	kgs	Teaspoonfuls	Tablets
20	9	1 teasp. (5 ml)	½ tablet
40	18	2 teasp. (10 ml)	1 tablet
60	27	3 teasp. (15 ml)	1½ tablets
80	36	4 teasp. (20 ml)	2 tablets or 1 DS tablet

For patients with renal impairment:

Creatinine Clearance (ml/min)	Recommended Dosage Regimen
Above 30	Usual standard regimen
15-30	½ the usual regimen
Below 15	Use not recommended

***Pneumocystis carinii* pneumonitis:** Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

Supplied: Double Strength (DS) tablets, each containing 160 mg trimethoprim and 800 mg sulfamethoxazole, bottles of 100; Tel-E-Dose® packages of 100. Tablets, each containing 80 mg trimethoprim and 400 mg sulfamethoxazole—bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 40, available singly and in trays of 10. Oral suspension, containing in each teaspoonful (5 ml) the equivalent of 40 mg trimethoprim and 200 mg sulfamethoxazole, fruit-licorice flavored—bottles of 16 oz (1 pint).



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Please see back cover.

Her next attack of cystitis

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Bactrim diffuses into vaginal fluid in effective concentrations, thus combating migration of pathogens into the urethra.

Studies have shown that Bactrim acts against *Enterobacteriaceae* in the bowel without the emergence of resistant organisms. Thus, Bactrim reduces the risk of introital colonization by fecal uropathogens. It has no significant effect on other normal, necessary intestinal flora.

Bactrim fights uropathogens in the urinary tract/vaginal tract/lower intestinal tract

Please see reverse side for summary of product information.

Arizona Medicine



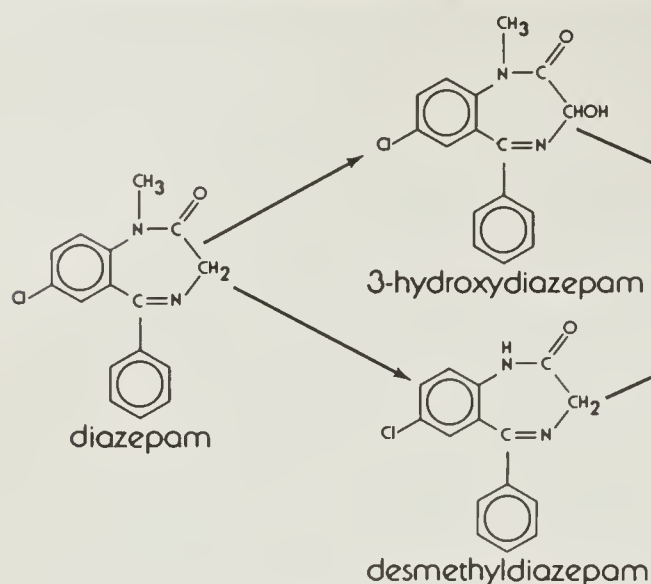
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Valium® (diazepam) ^{IV}

2-mg, 5-mg, 10-mg scored tablets
a prudent choice in psychic
tension and anxiety

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; symptomatic relief of acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due

to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome; convulsive disorders (not for sole therapy).

Contraindicated:

Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma;

may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients.

Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

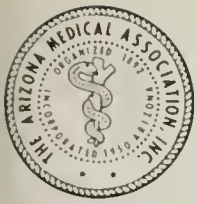
Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.



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JOURNAL OF ARIZONA MEDICAL ASSOCIATION

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COVER

We are pleased to salute the President of the Arizona Medical Association, John F. Kahle, M.D. Elected to office April 26, 1977.

Published monthly by The Arizona Medical Association, Inc., with offices at 810 W. Bethany Home Rd., Phoenix, Arizona 85013. Subscription \$20 a year, single copy \$2.00. Second class postage paid at Phoenix, Arizona, and at additional mailing offices.

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Each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine HCl, and 2 mg phenobarbital; the alcohol content is 15%

See next page for brief summary

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Tedral SA: each tablet contains 180 mg anhydrous theophylline (90 mg in the immediate release layer and 90 mg in the sustained release layer); 48 mg ephedrine hydrochloride (16 mg in the immediate release layer and 32 mg in the sustained release layer); 25 mg phenobarbital in the immediate release layer.

Tedral Elixir: each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine hydrochloride, and 2 mg phenobarbital; the alcohol content is 15%.

Indications. Tedral, Tedral SA, and Tedral Elixir are indicated for the symptomatic relief of bronchial asthma, asthmatic bronchitis, and other bronchospastic disorders. They may also be used prophylactically to abort or minimize asthmatic attacks and are of value in managing occasional, seasonal or perennial asthma.

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Tedral Elixir is convenient for persons who may have difficulty in swallowing tablets.

These Tedral formulations are adjuncts in the total management of the asthmatic patient. Acute or severe asthmatic attacks may necessitate supplemental therapy with other drugs by inhalation or other parenteral routes.

Contraindications. Sensitivity to any of the ingredients; porphyria.

Warnings. Drowsiness may occur. PHENOBARBITAL MAY BE HABIT-FORMING.

Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

Average Dosage. *Prophylactic or Therapeutic.*

Tedral: *Adults*—One or two tablets every 4 hours. *Children*—(Over 60 lb) one-half the adult dose.

Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: *Note:* One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

Supplied. Tedral: White, uncoated scored tablets in bottles of 24 (N 0047-0230-24), 100 (N 0047-0230-51) and 1000 (N 0047-0230-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0230-11).

Tedral SA: Double-layered, uncoated, coral/mottled white tablets in bottles of 100 (N 0047-0231-51) and 1000 (N 0047-0231-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0231-11).

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RESEARCH

Mailgram 2

THERE ARE A LOT OF PEOPLE GETTING BETWEEN YOU AND YOUR PATIENT.

Medicine today is in the spotlight, subjected to all kinds of scrutiny. Your control over patient therapy is being monitored, judged and occasionally abrogated, sometimes by unknown third parties.

The worry is that in the wake of this focus, the relationship between you and your patient will be weakened, without offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent,

generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than \$1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.



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See adjacent page for brief summary of prescribing information

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(Sodium Levothyroxine Tablets, U.S.P.)

INDICATIONS—**LETTER**® (Sodium Levothyroxine Tablets, U.S.P.) is indicated as replacement or substitution therapy for diminished or absent thyroid function

CONTRAINDICATIONS—**LETTER**® (Sodium Levothyroxine Tablets, U.S.P.) administration is contraindicated in thyrotoxicosis and in acute myocardial infarction. **LETTER**® is contraindicated in the presence of uncorrected adrenal insufficiency because it increases the tissue demands for adrenocortical hormones and may cause an acute adrenal crisis in such patients (See Warnings)

WARNINGS—**LETTER**® should be used with caution in patients with cardiovascular disease, including hypertension. The development of chest pain or other aggravation of cardiovascular disease will require a decrease in dosage

Injection of epinephrine in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This may be enhanced in patients receiving thyroid preparations. Careful observation is required if catecholamines are administered to patients in this category. Patients with coronary artery disease should be carefully observed during surgery, since the possibility of precipitating cardiac arrhythmias may be greater in those treated with thyroid hormones

Thyroid replacement may potentiate anticoagulant effects with agents such as warfarin or bishydroxycoumarin and reduction of one-third in anticoagulant dosage should be undertaken upon initiation of **LETTER**® (Sodium Levothyroxine Tablets, U.S.P.) therapy. Subsequent anticoagulant dosage adjustment should be made on the basis of frequent prothrombin determinations

In patients whose hypothyroidism is secondary to hypopituitarism, adrenal insufficiency will probably also be present. When adrenal insufficiency and hypothyroidism coexist, the adrenal insufficiency should be corrected by corticosteroids before administering thyroid hormones

PRECAUTIONS—Patients with hypothyroidism, and especially myxedema, are particularly sensitive to thyroid preparations so that treatment should begin with small doses and increments should be gradual

In patients with diabetes mellitus, addition of thyroid hormone therapy may cause an increase in the required dosage of insulin or oral hypoglycemic agents. Conversely, decreasing the dose of thyroid hormone may possibly cause hypoglycemic reactions if the dosage of insulin or oral hypoglycemic agents is not adjusted

ADVERSE REACTIONS—Excessive dosage of thyroid medication may result in symptoms of hyperthyroidism. Since, however, the effects do not appear at once, the symptoms may not appear for one to three weeks after the dosage regimen is begun. The most common signs and symptoms of overdosage are weight loss, palpitation, nervousness, diarrhea or abdominal cramps, sweating, tachycardia, cardiac arrhythmias, angina pectoris, tremors, headache, insomnia, intolerance to heat and fever. If symptoms of overdosage appear, discontinue medication for several days and reinstitute treatment at a lower dosage level

DOSAGE AND ADMINISTRATION—As with any type of thyroid administration, the dosage of **LETTER**® (Sodium Levothyroxine Tablets, U.S.P.) must be individualized to approximate the deficit in the patient's thyroid secretion. The response of the patient is determined by clinical judgment in conjunction with laboratory findings

HOW SUPPLIED—**LETTER**® (Sodium Levothyroxine Tablets, U.S.P.) is available in bottles of 100 tablets and larger. The 0.05 mg, 0.1 mg, 0.15 mg, 0.2 mg, and 0.3 mg potencies are also available in cartons of 100 (10 strips of 10 tablets) packaged in Unit Dose as Armadose®. Each **LETTER**® Tablet is distinctively colored and bears identifying markings

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Figure 1.



Figure 2.



Figure 3.



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			Guaranteed Male	Guaranteed Female	Non-Guaranteed Male	Non-Guaranteed Female
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45	32,164	45,264	205	186	361	337
55	13,523	15,492	86	78	123	115

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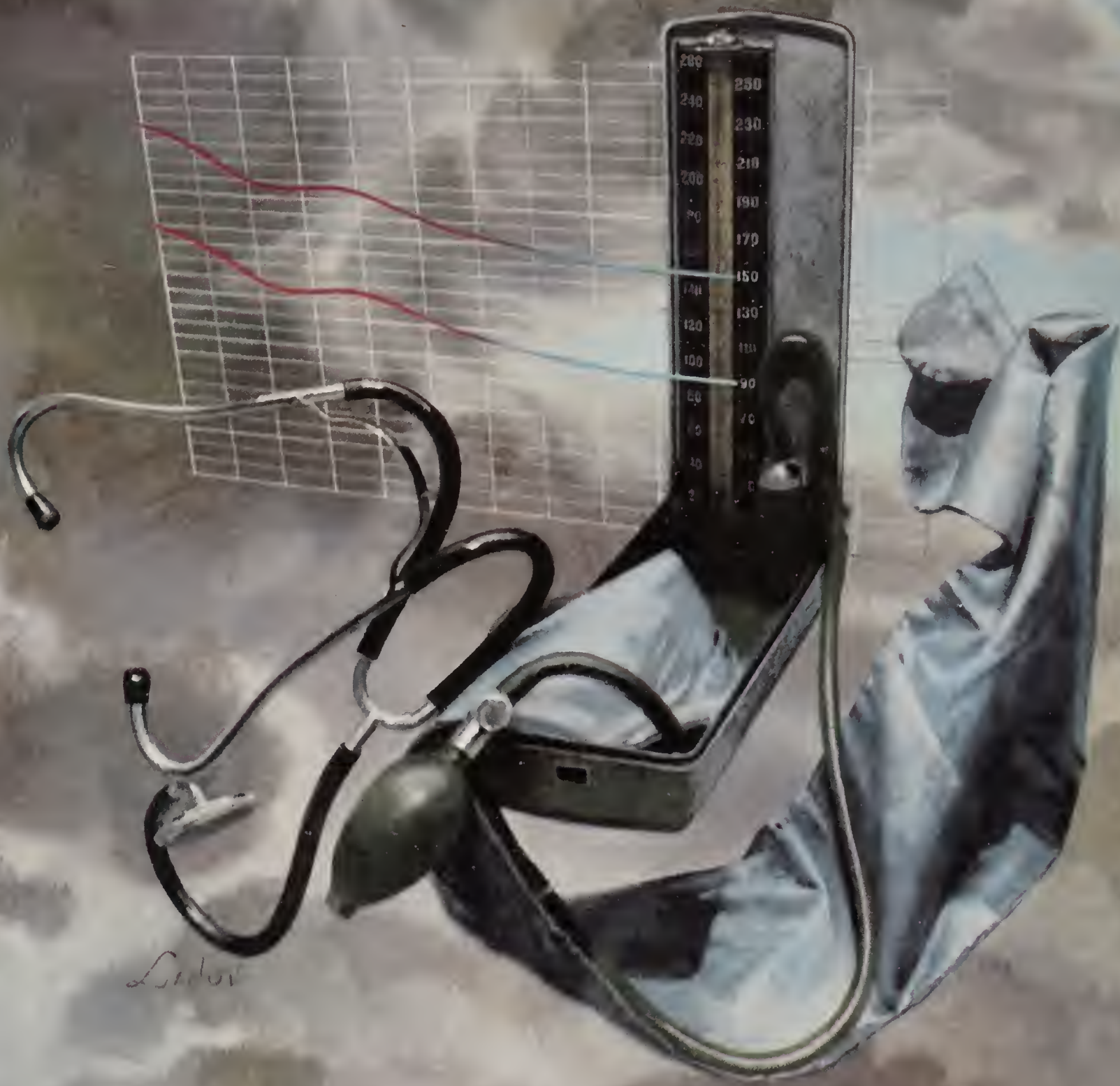
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age requires that potential benefits be weighed against possible hazards to the fetus. Zaroxolyn appears in the breast milk. Not for pediatric use. **Precautions:** Perform periodic examination of serum electrolytes, BUN, uric acid, and glucose. Observe patients for signs of fluid or electrolyte imbalance. These determinations are particularly important when there is excessive vomiting or diarrhea, or when parenteral fluids are administered. Patients treated with diuretics or corticosteroids are susceptible to potassium depletion. Caution should be observed when administering to patients with gout or hyperuricemia or those with severely impaired renal function. Hyperglycemia and glycosuria may occur in latent diabetes. Chloride deficit and hypochloremic alkalosis may occur. Orthostatic hypotension may occur. Dilutional hyponatremia may occur in edematous patients in hot weather. **Adverse Reactions:** Constipation, nausea, vomiting, anorexia, diarrhea, bloating, epigastric distress, intrahepatic cholestatic jaundice, hepatitis, syncope, dizziness, drowsiness, vertigo, headache, orthostatic hypotension, excessive volume depletion, hemoconcentration, venous thrombosis, palpitation, chest pain, leukopenia, urticaria, other skin rashes, dryness of mouth,

hypokalemia, hyponatremia, hypochloremia, hypochloremic alkalosis, hyperuricemia, hyperglycemia, glycosuria, raised BUN or creatinine, fatigue, muscle cramps or spasm, weakness, restlessness, chills, and acute gouty attacks. **Usual Initial Once-Daily Dosages:** mild to moderate essential hypertension—2½ to 5 mg; edema of cardiac failure—5 to 10 mg; edema of renal disease—5 to 20 mg. Dosage adjustment may be necessary during the course of therapy. **How Supplied:** Tablets, 2½, 5 and 10 mg

References:

- 1 Dornfeld L, Kane R: Metolazone in essential hypertension. The long-term clinical efficacy of a new diuretic. *Curr Ther Res* 18: 527-533, 1975
- 2 Data on file, Medical Department, Pennwalt Prescription Products

 **PENNWALT**

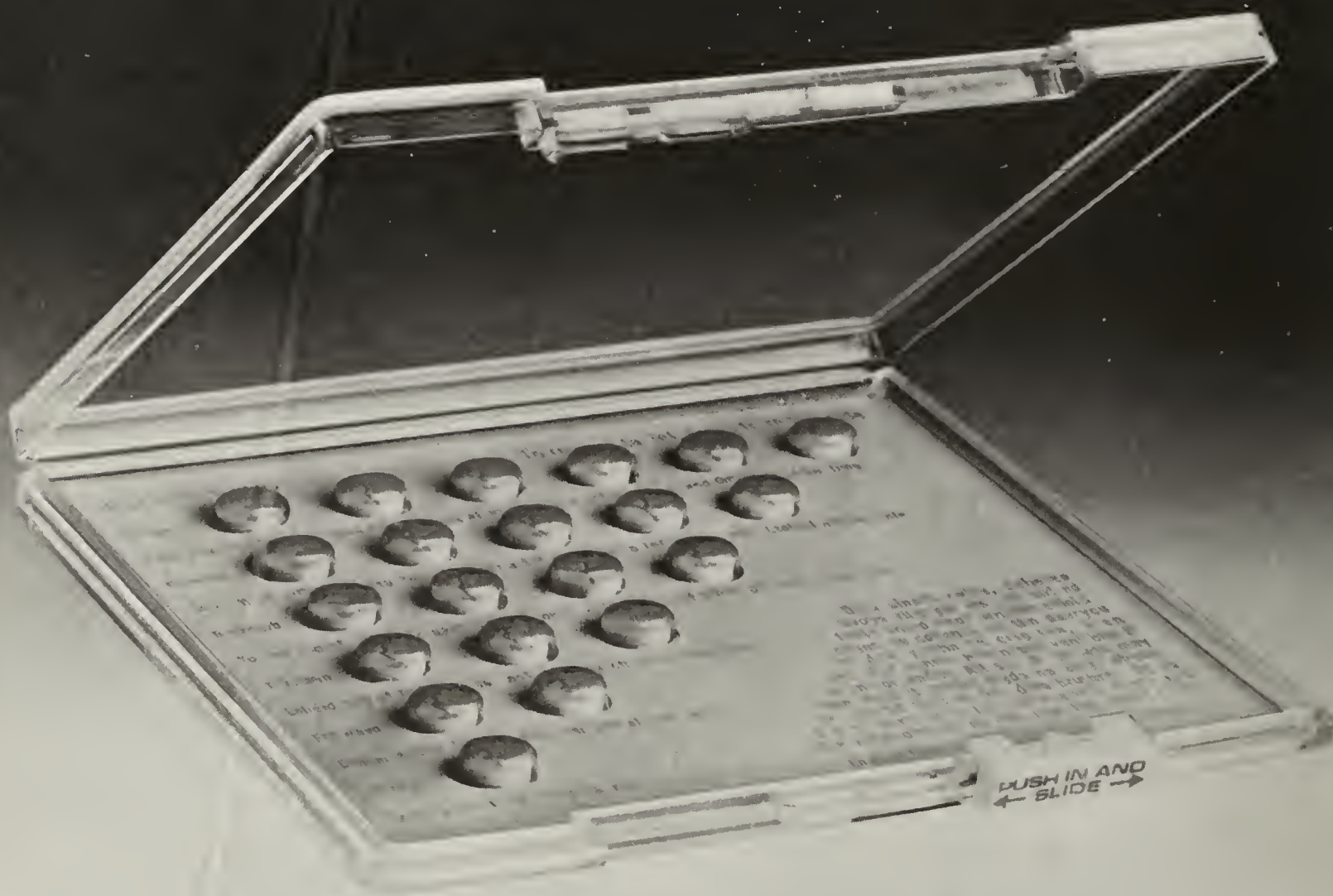
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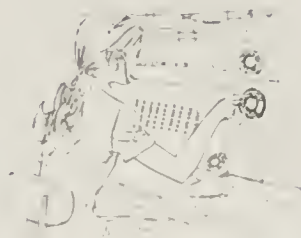
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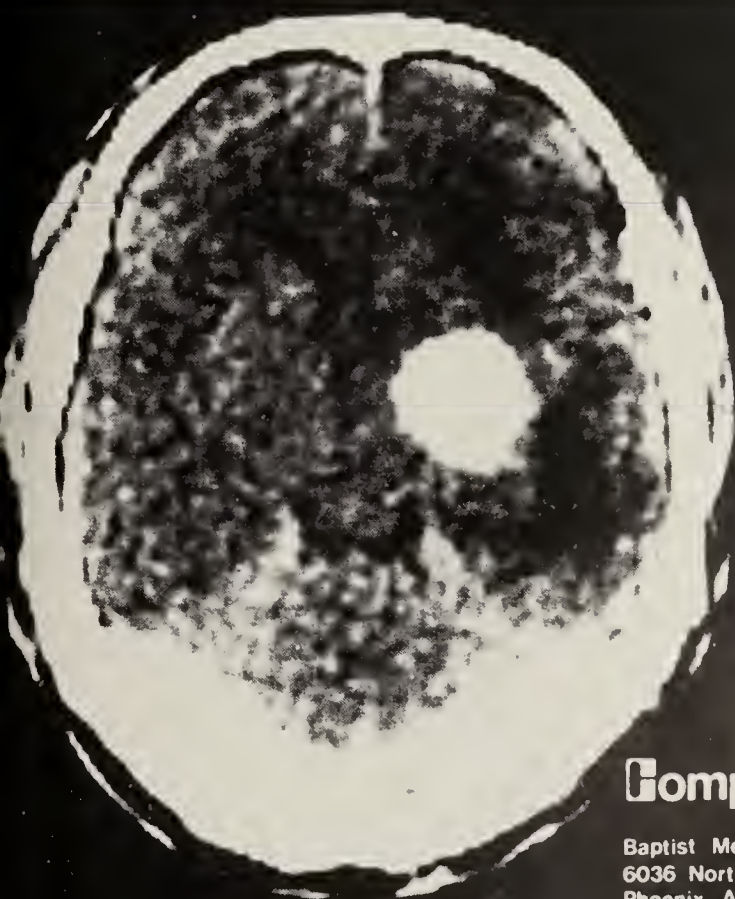


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Contraindications and Cautions: There are no known contraindications to oral use
when administered in recommended doses. Should not be given immediately postpartum
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Intravenous administration should not be given because of increased likelihood of side
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Adverse Reactions: On rare occasions oral administration of the drug has been asso-
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Supplied: Tablets, 10 mg., bottles of 100, 1000, 5000 and Unit Dose; Tablets, 20 mg.,
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***Indications:** Based on a review of this drug by the National Academy of Sciences-
National Research Council and/or other information, the FDA has classified the indi-
cations as follows:

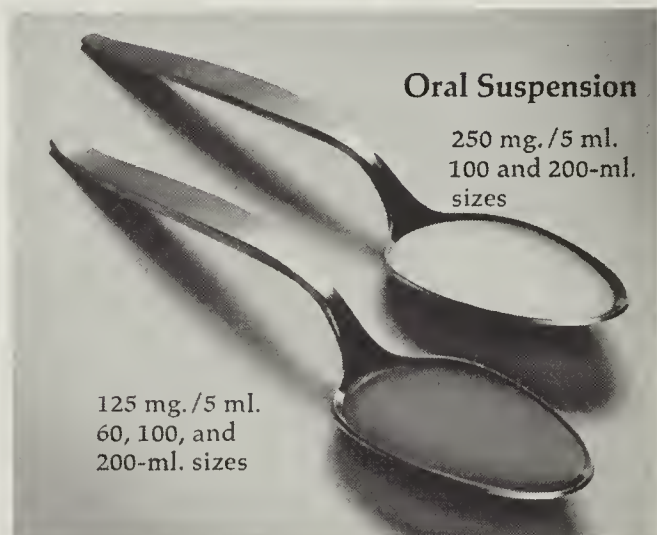
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2. In peripheral vascular disease of arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's Disease) and Raynaud's disease.

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Causes of Respiratory Allergy in Arizona

PART I

Hugh C. Thompson, M.D.
Elizabeth Gundersen, M.D.
Richard A. McNeely, M.A.

Editors

Robert J. Clark, M.D.
Lynn M. Taussig, M.D.
William C. Weese, M.D.

Respiratory allergy is frequently the interaction between a susceptible person and pollen. However, fungi, infections, air pollution and climate are also recognized as incitants. These factors are related to other variables: geography, industry, population characteristics, and those who provide care, the physicians. Arizona is unusual in the complexity and rapidly changing nature of factors which influence respiratory allergic disease (Figure 1). This article will discuss these factors and their interrelationship. A thorough understanding of the etiology of respiratory allergy is essential for successful patient management.

Geography and Climate

Geography and climate are obviously interrelated. They influence respiratory allergy by determining native vegetation (hence the pollens), fungal growth and the distribution of other air pollutants. Temperature and humidity also have a direct influence on patient symptoms. The complexity of Arizona geography is shown in Figure 2. Approximately 42% of the state is desert, 25% grassland, and 33% forest. Yearly rainfall ranges from 3-11 inches in the desert to three times that in the high forest. Mean temperature declines with eleva-

tion. Irrigated land is now 10-15% greater than shown in the map, data for which were compiled 25 years ago. Native vegetation with allergenic pollen includes saltbush, rabbit bush and mesquite in the southern desert, sagebrush in the northern desert, and juniper in the forest. Other native pollens of the grassland and forest such as aspen, certain grasses, pinon pine, and oak are felt to cause symptoms in some people, but the extent of their allergenicity requires definition. As shown by the map, within the distance of a few miles, an individual may be exposed to several types of pollen.

Climatic factors control pollen and fungal growth and distribution, as well as the concentration of air pollutants. Recent temperature sums, soil moisture, evapotranspiration and antecedent summer sunshine and rainfall all play a part in pollen production. Solomon and Hayes¹ have shown that the climate of the several previous months alters the quantity of tree, grass and rabbit bush pollen.¹ Southern Arizona summer soil moisture is ephemeral due to intense rains with rapid runoff, high temperatures and high evaporation rates. In contrast, the relatively light winter rains frequently last several days, and lower temperatures and lower evaporative power of the air, may leave the soil saturated for several days or weeks. Therefore, in southern Arizona, water stress is greatest when pollen is pro-

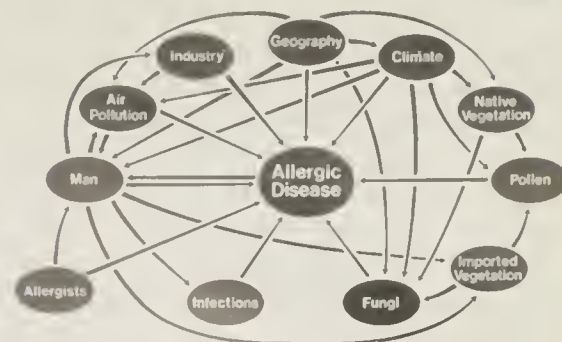


Figure 1. Causes of Allergic Respiratory Disease in Arizona.

duced, and is least in the winter at a time when most plants are relatively inactive.

Pollen emission is related to day and night temperatures, solar radiation received on the ground, air movement, relative humidity, rainfall, soil moisture and barometric pressure. Early morning emission may be related to increases in solar radiation and/or the subsequent decline in relative humidity.

Pollen dispersal is related to pollen grain size, density, wind velocity, and turbulence. Wind velocity and turbulence account for vertical and horizontal diffusion. Rainfall and air mass are also important.

Prevailing winds carry pollens in certain directions.² The prevailing wind in Phoenix is from the east, but in Tucson from the northwest in the summer and northeast in the winter. Highly allergic individuals should locate their homes with wind direction in mind.



Figure 2. Distribution of Natural Vegetation in Arizona (Adapted from Nichol, A.A. Technical Bulletin 127, University of Arizona, 1952).

From: Dept. of Pediatrics, Arizona Health Sciences Center (Drs. Thompson & Gundersen), and Medical Audiovisual Services U. of A. Tucson (Mr. McNeely).

The growth of fungi varies with the season; commercial crops depend on local weather conditions. The concentration of pollens, fungi, and other air pollutants is determined by the changing height of inversion layers in valleys. In summer, the inversion layer is 10,000 feet and in winter, 2,500 feet. Compression of aeroallergens and pollutants to roughly one fourth the summer volume occurs during the winter months. Winds can cause profound dust storms in some areas.

Climate directly affects normal man and, in particular, allergic individuals. Much of Arizona's population emigrated because of dryness and warmth. Allergic individuals may wheeze the day before or the day of a storm. This is probably due not to humidity alone, but possibly to a combination of changes in barometric pressure, reduced temperature, and humidity. The sharp dip in night temperature, characteristic of the desert, is a possible cause of wheezing.

Cold fronts following warm fronts can cause wheezing, but the major storms that traverse Arizona may not be so troublesome. Fewer major storms cross southern Arizona than most other parts of the nation in winter and summer.² Clouds and major storms are largely absent over Arizona, southern California, Nevada and northern Mexico in summer, because pressure and temperature gradients prevent moisture laden air from crossing these states.³ The area is therefore more comfortable for some asthmatics.

Fungi

The main allergenic fungi in Arizona are ubiquitous throughout the United States: *alternaria*, *hemlinthosporium*, *hormodendrum* (*cladosporium*), *aspergillus*, and *penicillium*.⁴ Although traditionally found in damp areas, some fungi have adapted well to dryness and reproduce at humidities as low as 10%. Fungi grow on hay, grain, leaves, dung, plants, and soil. *Alternaria* is said to thrive in the bark of the mesquite tree. Irrigation ditches, evaporative air coolers, cattle tanks, and lakes all supply good culture media. Damp hay or straw is particularly selective for *aspergillus*. Sinski has stated that handling hay in a barn will increase the mean *aspergillus* spore count 140 to 340 times.⁵ Arizonans who ride horses or feed cattle will be heavily exposed. Molds associated with dead crops and irrigation may cause allergic disease.

To be continued



Drug Therapy Problems

ROBERT E. PEARSON, M.S., R.Ph.

Abstract Of Interest:

Chopra, D. (Medical Service, Boston Veterans Administration Hospital, 150 S. Huntington Avenue, Boston, MA 02130). Janson, P., and Sawin, C.T.: Insensitivity to Digoxin Associated with Hypocalcemia, *N Eng J Med* 296:917-918, 1977.

The authors present an unusual case report. An 85-year-old man was admitted to a hospital with the chief complaint of shortness of breath. After physical and laboratory examinations, a therapy of bed rest, a low salt diet, furosemide, and digoxin was begun. Serum digoxin levels were maintained at 1.5-3.0ng/ml with no decrease in ventricular rate (180 beats/min. on admission). Serum calcium was 6.7mg/dl on admission. Only when the serum calcium level began to rise, did the ventricular rate drop toward normal. The serum calcium stabilized at 8.5mg/dl and the ventricular rate stabilized at 80 beats/min. The authors suggest hypocalcemia be added to the list of causes of resistance to digitalis glycosides.

Abstract Of Interest:

Siegel, W.H. (Department of Urology, Mt. Sinai Medical Center, Miami Beach, FL, 33140): Unusual Complication of Therapy with Sulfamethoxazole-Trimethoprim, *J Urol* 117:397, 1977.

A case report is presented of a 72-year-old male seen in the emergency room with the chief complaint of not having voided for 18 hours. He also stated that he had noticed a decrease in urinary volume during the previous 24-36 hours. The patient had been receiving therapy for chronic prostatitis with co-trimoxazole for approximately 2 weeks (dosage not stated) prior to his appearance at the emergency room. The patient was admitted and had numerous examinations of his urinary system (e.g. cystogram, IVP, renal scan, and cystos-

copy). The last examination occurred 5 days post admission and revealed bilateral ureteral obstruction by stone. The stones were removed and analyzed. The stone from the left side was calcium oxalate, while that from the right was a pure metabolite of co-trimoxazole. The patient has fully recovered with no complications.

Abstract Of Interest:

Shankaran, S. (Childrens Hospital Michigan, 3901 Beaubien Blvd., Detroit MI 48201), and Poland, R.L.: The Displacement of Bilirubin from Albumin by Furosemide, *J Pediatr* 90:642-646, 1977.

Three methods were used to assess the degree of bilirubin displacement from albumin by furosemide compared to known displacer of bilirubin, sulfisoxazole. The authors chose a whole blood fractionation technique, a hydroxybenzeneazobenzoic acid dye-binding technique, and a measurement of change in bilirubin concentrations in adult Gunn rats as their methods. The first technique utilized whole blood obtained from jaundiced infants prior to exchange transfusion and showed that furosemide was about equal, on a molar basis, to sulfisoxazole as a displacer of albumin bound bilirubin. The second technique utilized icteric sera and showed that increasing concentrations of furosemide yielded a corresponding decrease in dye binding capacity. Injection of furosemide intraperitoneally into adult Gunn rats caused a significant decrease in serum albumin. The authors conclude that on a molar basis, furosemide is comparable to sulfisoxazole in its capacity to displace bilirubin from albumin.

Abstract Of Interest:

Conn, H.O. (Veterans Administration Hospital, West Spring Street, West Haven, CT 06516), Leevy, C.M., Vlahcevic, Z.R., Rodgers, J.B., Maddrey, W.C., Seeff, L., and Levy, L.L.: Comparison of Lactulose and Neomycin in the Treatment of Chronic Portal-Systemic En-

Address all communications to the author, Mr. Pearson is Education/Research Associate with David Wastchak & Associates, Inc., Pharmaceutical Consultants, 1818 Grand Avenue, Phoenix, Arizona 85007. (602) 253-9323.

phalopathy, *Gastroenterology* 72:573-583, 1977.

A multi-center, randomized, double-blind clinical trial was conducted to compare neomycin with lactulose treatments of chronic portal-systemic encephalopathy (PSE). Patients selected for the study had chronic or recurrent PSE. A total of 33 patients were selected and served as their own controls. A double drug system was used to maintain the double blindness of the trial because of the obvious difference between dosage forms of the two drugs. Placebo tablets and sorbitol syrup became the control drugs. The investigators attempted (with less than 60% success rate) to guess which pair of drugs some of the patients were receiving. The study utilized 10-day control periods, before, between, and after the active treatment periods A & B. Neomycin or placebo was administered at a level of 1.5g four times daily. Lactulose or sorbitol was administered at 30ml four times daily, initially, and then adjusted to induce 2-3 stools per day. Dietary protein was kept at approximately 40g daily. The investigators evaluated the patients' status via the following: mental stress, trailmaking test, EEG, blood ammonia concentration, blood pH, a PSE index, and stool studies. The authors conclude that both neomycin and lactulose are effective in treating PSE.

Abstract Of Interest:

Schooley, R.T. (Laboratory of Clinical Investigation, Bldg. 10; Rm. 11S-242, Nat'l Institute of Allergy & Infectious Disease, NIH, Bethesda, MD 21205), Vagley, P.F., and Lietman, P.S.: Edema associated with Ibuprofen Therapy, *JAMA* 237:1716-1717, 1977.

A 71-year-old man was admitted to the hospital with a chief complaint of a 4.85kg weight gain during the previous ten days. The patient had been receiving 400mg of ibuprofen four times daily for treatment of left sacroiliac discomfort. A previous 12-day course (6 months earlier) of the same therapy had been successful in alleviating the discomfort. Seven days after the second course of therapy had begun, the patient was examined and showed no edema. Six days after examination, his ankles were swollen. Four more days passed, and he was admitted at day 17 of therapy showing a 14.85kg weight gain with congestive heart failure. Diuretic therapy and discontinuation of ibuprofen resulted in the loss of all weight gained and resolution of the signs of congestive heart failure.



The Earthquake That is Underfoot: Greater Appreciation of Endocrine Deficiency States

Marshall B. Block, M.D.

The relevance of basic research to clinical medicine has been amply demonstrated by recent advances in our understanding of hormone deficiency states. Most hormones are made not only as the active principle, but are first produced within the body as larger weight molecular compounds within which the active principle is located. Through various processes, some involving enzymes, the active hormone is liberated, which is then measured in the peripheral circulation. This concept has greatly enhanced our understanding of various clinical states. For instance, in Cushing's disease, not only is "small" ACTH found in the plasma, but a larger molecular weight compound having similar immunological properties to the ACTH molecule has also been measured. Likewise, tumors which make ectopic ACTH produce the large molecular weight compound which has diminished biological activity. In addition, pancreatic beta cell tumors make proinsulin in larger than normal amounts and it, too, has little biological activity. Similar situations have been demonstrated for hormones such as thyroid stimulating hormone, growth hormone, prolactin, parathormone and even renin. Thus, we can now recognize clinical situations in which large molecular weight precursors are predominantly secreted but retain little biological activity. Therefore, a hormone deficiency state can arise from biosynthetic defects. For instance, there can be hormone deficiency states because the hormone is not produced at all, or an abnormal amino acid sequence results in the hormone not being folded on itself appropriately, or a hormone can be made that is normal, but for some reason is not converted to its active principle be-

cause of one or another enzymatic defects within the cell of origin.

In addition to these possible defects resulting in hormone "deficiencies," a normal hormone generated from its larger molecular weight precursor may not be liberated into the plasma because of abnormalities in the secretory process within the cell of origin. There probably are various avenues through which abnormalities in the secretory process can result in hormone deficiency states. For instance, we have learned from various polypeptide secreting cells that the granules which contain the active hormone must first migrate from the perinuclear region to the cell surface. These granules must then fuse with the cell membrane through a process called emiocytosis and then liberate their contents into the bloodstream. Various abnormalities in these pathways can likewise give rise to a "hormone deficiency state," which clinically could not be differentiated from any of the other above possibilities.

A third possibility to account for hormone deficiency states has recently become apparent. Hormones, once secreted, need to somehow generate a signal in their target cells. This is thought to be accomplished by the hormone binding with a receptor on the target cell membrane which in turn produces further changes within the cell. Abnormalities here can also be immense, i.e., the "receptors" for the hormone in question may be absent, or the receptors may be reduced in number, or the receptors may be preoccupied, or there may be compound which circulates in the blood which binds with the hormone and thus blocks it from combining with its receptor. Various clinical states for many years have been recognized as probably due to such defects, i.e., classical nephrogenic diabetes insipidus (normal hor-

none, abnormal receptor in kidney), pseudohypoparathyroidism (normal parathormone, abnormal kidney or bone receptors), insulin resistant diabetes mellitus, (normal insulin with decreased number of receptors as in obesity or normal insulin but insulin receptor immunoglobulin which limits insulin from getting to its receptors).

Furthermore, even if the hormone can bind with its receptor, there has to be a secondary signal generated from the combination of these two compounds to cause the effected cell to produce the desired response. Obviously, abnormalities in one or many of these heretofore unknown steps may also produce a "hormone deficiency state." Such a situation has clinical relevance, for it has now been demonstrated that there are rare types of diabetes insipidus where there are measureable levels of antidiuretic hormone in the plasma which appears to bind normally with the receptor in the kidney cell but the signal that should be generated by this combination does not take place. Thus the body looks and feels as if it has diabetes insipidus due to complete lack of antidiuretic hormone, when in fact the hormone is normal, the receptor is normal, but the generation of the signal from the combination of the two is abnormal.

Medicine as a clinical entity is stable but there is an earthquake underfoot which is enabling us to further categorize and classify clinical conditions according to etiology. This hopefully will enable us to either prevent or at least therapeutically be more selective in our treatment of these conditions.

REFERENCES

- Barr, R.S., Roth, J.: Insulin receptor status in disease states of man. *ARCHIVES INTERNAL MEDICINE*, 137:474, 1977.
- Kahn, C.R., et al.: Receptors for peptide hormones, *ANNALS INTERNAL MEDICINE*, 86:205-219, 1977.
- Kawanishi, K., et al.: Successful immunosuppressive therapy in insulin resistant diabetes caused by anti-insulin receptor or antibodies. *GENERAL CLINICAL ENDOCRINOLOGY AND METABOLISM*, 44:15, 1977.



*Seminars in
Gastroenterology
and Liver Disease*

Indications For Colonoscopy

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Indications For Colonoscopy

1. The presence of a gastrointestinal polyp
 - a. For purposes of polypectomy
 - b. For evaluation of more significant lesions in the patient with a small polyp
 - c. Follow-up evaluation in high risk patients
2. Questionable X-ray lesion, e.g.; diverticulosis versus neoplasm, evaluation of irregularities at a surgical anastomosis
3. Inflammatory bowel disease
 - a. Proctosigmoiditis versus ulcerative colitis, i.e.; abnormal proctoscopy without a cutoff between normal and abnormal tissue in the presence of normal X-rays.
 - b. The differentiation of Crohn's versus ulcerative colitis

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- c. Evaluation of strictures
- d. Clinical suspicion of inflammatory bowel disease with normal or questionably abnormal X-rays
4. Lower gastrointestinal bleeding
 - a. Undiagnosed by X-ray contrast studies
 - b. Occult bleeding in the presence of a negative X-ray

1. The Presence of a Gastrointestinal Polyp

Polypectomy is the most well known indication for colonoscopy.^{1,2} In general any polyp over one centimeter in size which is pedunculated should be removed and examined. Unfortunately simple biopsy of a polyp is only of value if the tissue removed is malignant since one focus of a polyp may be benign while another area demonstrates invasive cancer. If carcinoma in situ is demonstrated at pathology, the polypectomy can usually be considered curative. If invasion of the stalk is present many would recommend that the patient be referred to a surgeon for segmental resection. Certainly metastatic disease has been described from polyps with invasive carcinoma.³ However, this seems to be very low. Wolff and Shinya feel that local excision is all that is required if adequate clearance exists between tumor and excision site.⁴ It has been my experience that approximately one out of twenty polyps over one centimeter diameter have areas of invasive carcinoma.

There is some question as to whether all patients with polyps of any size should not undergo colonoscopic examination to rule out more significant lesions. This would depend in some degree on the technical quality of the barium enema which demonstrated the polyp. In my opinion, patients with colon polyps of any size should have complete colonoscopic examination unless a contraindication exists.

Follow-up evaluation of high risk patients, in addition to regular examinations for occult blood, barium enema should include periodic colonoscopic evaluation. This group of patients would include:

- a. Patients with previous resection for carcinoma of the colon
- b. Patients with long term chronic ulcerative colitis, i.e.; greater than ten years
- c. Familial syndromes associated with carcinoma of the colon

2. Questionable X-Ray Lesions

In the past there were many occasions

When a barium enema would demonstrate an area which was difficult to distinguish between diverticular disease and neoplasm. Although these instances still occur it is no longer a clinical problem because colonoscopy is able to solve the majority of these questions.

The same is true of a number of other problems which frequently had to be solved by surgical exploration. Irregularities at a surgical anastomosis are often confusing as are benign submucosal lesions of various types. The inverted stump following an appendectomy may be confused as a cecal mass.

3. Inflammatory Bowel Disease

a. Proctosigmoiditis versus Ulcerative Colitis

Prior to colonoscopy a diagnosis of ulcerative proctitis (a benign condition with none of the long or short term consequences of ulcerative colitis) was diagnosed on the basis of an abnormal sigmoidoscopic examination and a normal barium enema. It was then often said that patients with ulcerative proctitis would occasionally develop ulcerative colitis with time. Colonoscopy has demonstrated that many of these concepts are erroneous. Although it may occur, patients with ulcerative proctitis rarely develop ulcerative colitis. The initial misdiagnosis of ulcerative proctitis is based on the relative insensitivity of barium enema to early inflammatory bowel disease. Although colonoscopy is not usually indicated to demonstrate "extent of disease" in inflammatory conditions of the bowel, in this situation it is very useful in evaluating treatment, follow-up and long term prognosis. Most cases of ulcerative proctitis do demonstrate a cutoff point at approximately twelve to fourteen centimeters from the anal verge. If one sees this cutoff point at sigmoidoscopy, with normal mucosa above, the diagnosis of ulcerative proctitis is confirmed and colonoscopy need not be performed.

b. Differentiation of Crohn's Disease versus Ulcerative Colitis

Colonoscopy has been very useful in making this sometime difficult differentiation. This differential can be important clinically since a number of treatment modalities which work for ulcerative colitis do not work well for Crohn's disease and vice versa. In addition the surgical approach to these illnesses may differ considerably. Although the potential for developing malignancy is slightly increased in patients

with Crohn's disease it is not anywhere near the magnitude with which carcinoma of the colon occurs in long term ulcerative colitis.

c. Evaluation of Strictures

In general, patients with ulcerative colitis who have strictures require surgery. However, what often appears to be a stricture on barium enema may open up nicely during a colonoscopic examination. Colonoscopy under fluoroscopic control can demonstrate whether a stricture is fibrous or spastic. Multiple biopsies can be taken at the time of colonoscopy although the deep seated nature of the carcinoma which occurs with ulcerative colitis might not be reached by the superficial biopsies obtained at colonoscopy.

d. Clinical Suspicion of Inflammatory Bowel Disease With Normal or Questionably Abnormal X-Rays

Patients with significant diarrhea which is prolonged, particularly in association with arthritis, iritis or skin lesions, should arouse suspicion of inflammatory bowel disease. Barium enema may be very insensitive and every colonoscopist can point to many cases of rather florid inflammatory bowel disease not seen by X-ray.⁶

4. Lower Gastrointestinal Bleeding

Unfortunately, colonoscopy does not lend itself well to examination in the massively bleeding patient. One needs to have a very clean bowel in order to perform colonoscopy safely and colonoscopy probably should not be performed in brisk lower gastrointestinal hemorrhage. In the occult bleeder, however, colonoscopy has been invaluable. Unfortunately, carcinomas not seen by good barium enema examinations are not uncommon in a gastroenterologist's practice.

Patients who have recently had a massive bleed with a negative X-ray study may be candidates for colonoscopy. Whether or not a diagnosis of diverticulosis is accepted as the source of massive lower gastrointestinal bleeding should depend on the adequacy of the barium enema to exclude other disease. A patient who persists with occult bleeding after a massive bleeding episode should definitely have colonoscopy whether or not diverticular disease has been demonstrated by X-ray. Diverticular bleeding is usually brisk. Continued occult bleeding should alert the physician to exclude other lesions.

Contraindications to colonoscopy are as follows:

1. Inadequate preparation. As mentioned in the discussion of massive bleeding of the colon. Inadequate preparation of the bowel seriously impedes examination and makes the procedure more dangerous. In addition, when polypectomy is performed, potentially explosive gases such as methane and hydrogen are virtually eliminated by an adequate preparation. Although carbon dioxide insufflation is used by most colonoscopists during polypectomy, a good prep is additional insurance against the possibility of explosion.
2. Acute inflammatory bowel disease including acute ulcerative colitis or acute diverticulitis. Because the insufflation of air is required during colonoscopic examination, large intraluminal pressures may be obtained which might cause the weakened bowel to perforate.
3. Recent surgical procedures—colonoscopy probably should not be performed within three weeks of any type of gastrointestinal anastomosis.

In experienced hands colonoscopy is a safe procedure which is well tolerated by patients. Complications of the procedure are perforation and bleeding which occur primarily following polypectomy. The incidence of these complications in experienced hands runs approximately one to two percent with bleeding being more common than perforation. Bleeding usually does not require surgery. Perforation, if it occurs, is best managed by surgical closure of the perforation.

Because colonoscopy is a new procedure and indications for its performance have not been clearly expressed, colonoscopy is probably being underused as a diagnostic procedure at this time. Many of the "guessing games" about the presence or absence of a lesion on barium enema can be resolved easily with the use of colonoscopy.

REFERENCES

1. Wolff, W.I., Shinya, H.: *Advances in Surgery*, Chicago Year Book Medical, 1973.
2. Wolff, W.I., Shinya, H.: A new approach to colonic polyps. *Ann Surg* 178:367-78, 1973.
3. Manheimer, L.H.: Metastasis of the liver from a colonic polyp. Report of a case. *NEJM* 272:144-5, 1965.
4. Wolff, W.I., Shinya, H.: Earlier diagnosis of cancer of the colon through colonic endoscopy. *Cancer* 34:Suppl. 912-31, 1974.
5. Vandenheimer, M., et al.: Ulcerative colitis or Crohn's colitis? *Surg Clin of NA* 56:721-31, 1976.
6. Wolff, W.I., Shinya, H., Geffen, A., et al.: Comparison of colonoscopy and the contrast enema in five hundred patients with colorectal disease. *Amer J Surg* 129:181-6, 1975.



Infectious Disease

North American Blastomycosis

John F. Busey, M.D.

SUMMARY

The diagnosis of blastomycosis is often delayed or overlooked, even in endemic areas, because the physician fails to seriously consider it as a possibility. Awareness of the possibility is the key to making the diagnosis. The great mobility of the population of our nation is such that it is reasonable to assume that individuals with blastomycosis develop symptoms of the disease while residing in the coccidioidomycosis areas just as patients with coccidioidomycosis are encountered in the blastomycosis and histoplasmosis endemic areas.

INTRODUCTION

North American blastomycosis, predominantly a disease of the Mississippi-Ohio River Valley and Middle Atlantic states, does occasionally occur in other parts of the United States. Cases have been diagnosed and reported in at least 39 states.¹ Most but not all of the discovered cases outside the endemic area have developed in persons who either

visited or migrated from there. In many instances symptomology of the disease was not manifest for several years following the migration.² A few indigenous infections have occurred in the extreme northwestern United States; also, in several Canadian provinces the disease is not uncommon. Within the past decade, discovery of the disease has been made in numerous sites in the African Continent.

The causative organism is a diphasic fungus, *Blastomyces dermatitidis*, which grows in its yeast-like form at 37 degrees and in a mycelial or filamentous state at room temperature. The primary human infection is acquired by inhalation of the infective spores, products of the mycelial form. Existing evidence suggests the infection is acquired from the soil or perhaps from wood associated with the earth. The causative fungus has been recovered in nature only from the soil and from there in only a few instances until just recently when it was isolated from pigeon manure being used as fertilizer by an individual who developed blastomycosis.³

The incubation period following inhalation of the fungus is not specifically



Figure 1. A classical skin lesion showing clearly defined raised margins.

known but appears to fluctuate widely. The variations in some instances may be related to the size of the inoculum. The tissue response is equally unpredictable and may also be influenced by the number of inhaled spores. Infiltrative, pneumonic, nodular, or miliary types are observed.

The Course of the Disease

The course of the pulmonary lesion is generally chronic; however, it may be acute and fulminating. Spread of the disease from the lungs to the skin, subcutaneous tissues, genitourinary tract, bones, central nervous system or other areas is a characteristic of the infection; yet, in some instances a spread never occurs. The time at which dissemination



Figure 2. Chest roentgenogram with apical blastomycotic infiltrate not unlike what might be found with tuberculosis.

From: Mississippi Baptist Medical Center, Jackson, Mississippi 39201. Dr. Busey, Director Medical Education.

may develop is unpredictable. It may develop early during an acute phase of the infection; yet some chronic pulmonary infections are known to exist for many years before dissemination occurs. The type of the primary pulmonary lesion, i.e. infiltrative, pneumonic, etc. apparently does not influence the rapidly or propensity for dissemination. Some cases with extensive pulmonary involvement may reflect delayed or no dissemination; yet, others with minimal lung lesions may develop both early and widespread dissemination. It is not uncommon to find disseminated blastomycosis with no demonstrable pulmonary lesion remaining.

The skin is the most frequent site of dissemination. Although any skin area may become involved, exposed areas such as the face and forearms are the most frequently involved ones. Skin lesions are chronic and follow a relatively benign course. The lesions tend to maintain a round or oval shape with slightly raised borders with sharp demarcation from the adjacent normal skin. On the borders small pustules, generally covered with a dry or scaly crust, develop. Many of the peripheral lesions will show healing in their centers with atrophic, thin, smooth, silencing, noncontractile scars developing. Occasionally one skin lesion will spontaneously heal entirely while a nearby one grows larger. Regional lymphadenopathy is not present with the classical skin lesion.

The genitourinary tract and the osseous systems are the next two most frequently involved areas of dissemination. The kidneys, prostate, seminal vesicles, epididymis and testes are usual

sites. Osseous lesions develop in either long or flat bones. The lesion is characteristically destructive. Extension of the mycotic infection from bone into a joint space is not unusual. Sinus tracts with persistent discharge may develop from an involved bone or joint. Pathological fractures are not uncommon.

Clinical Presentation

Symptomology depends on the type and extent of the lung involvement as well as the location and extent of any dissemination. Fever, chest pain, cough, sputum production, weight loss and hemoptysis are usual symptoms.

The physical findings in the pulmonary stage are nonspecific and like the symptoms, they also depend on the type and extent of the lung lesion. The skin lesions which may develop are usually so characteristic that the diagnosis becomes apparent. Unfortunately, the search for the fungus in the sputum is occasionally not made in undiagnosed pulmonary disease until a classical skin lesion is seen. Because of the frequency of genitourinary tract involvement a search should be made for *B. dermatitidis* any time a patient with an undiagnosed pulmonary lesion develops any urinary tract symptoms.

Roentgenographic Appearance

The roentgenographic appearance of the lungs is quite variable, and many patterns are seen. Unfortunately no patterns are diagnostic, but some are at least suggestive and become even more suspect when they develop in particular clinical situations. Perhaps the most characteristic is a prominent hilar mass that has the appearance of a bronchogenic carcinoma. Apical infiltrates

are common and developing cavitation with hemoptysis is often erroneously considered to be tuberculosis. Acute pneumonic and miliary patterns are not uncommon and because of the poor prognosis, early recognition is essential. Any portion of any lung may be involved. Cavitation is often present. Pleurisy with or without effusion may develop, and rarely a spontaneous pneumothorax has been noted.

Immunological Aspects

Skin testing for blastomycosis is worthless, and no antigen is currently commercially available.

Complement-fixation studies are not diagnostic; none the less, they may be helpful in making the diagnosis. There is some degree of cross reactions among blastomycosis, coccidioidomycosis and histoplasmosis. This cross reaction is quite marked between histoplasmosis and blastomycosis.

Blastomyces antigens may evoke significant titers from patients with histoplasmosis, and histoplasma antigens may affect similarly elevations from blastomycosis patients. The height of the titers cannot be relied on for identification, inasmuch as the heterologous antigen often stimulates a higher response than does the homologous antigen. This is quite unfortunate because not only do histoplasmosis and blastomycosis occur in the same geographic area but also they often simulate each other and run similar clinical courses.

Undoubtedly the most important result of a positive complement-fixation test for either histoplasmosis or blastomycosis is not in making definite diagnosis but in bringing out the likely pos-

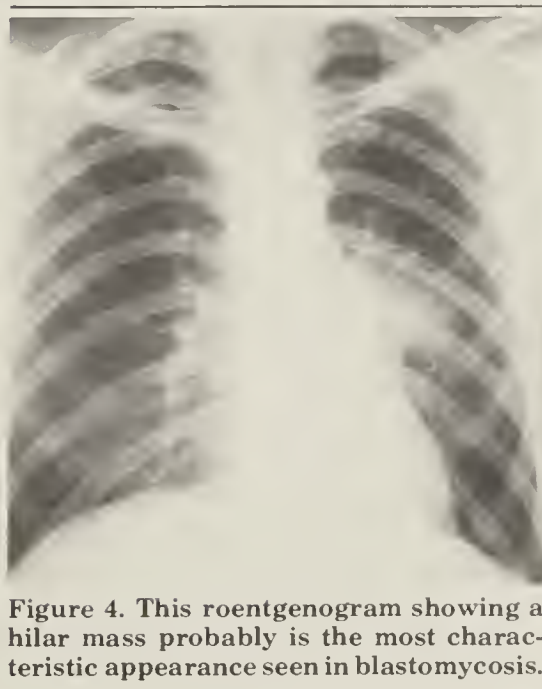




Figure 6. A chest roentgenogram in a blastomycosis patient. Bilateral involvement is a frequent occurrence.

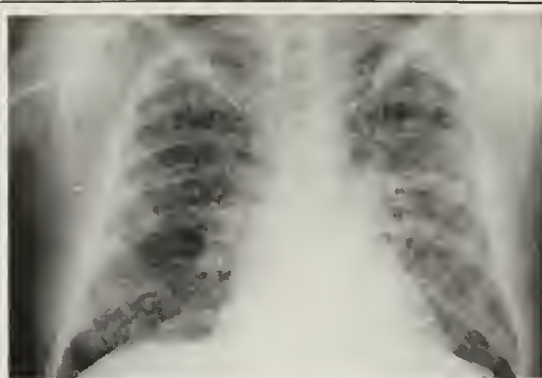


Figure 7. A pulmonary roentgenogram with a blastomycotic pattern which is indistinguishable from that seen in miliary tuberculosis. The poor prognosis in this type calls for early therapy.

sibility that a fungus infection may be present. The clinician and the laboratory can then redouble their efforts to demonstrate and identify the causative fungus.⁵

It should be remembered that complement-fixation titers rise in less than one half of patients with proved blastomycosis.

Diagnosis

Diagnosis depends upon the demonstration of the characteristic budding yeast form of the causative organism, *B. dermatitidis*, from the disease process. Contrary to popular belief, the fungus is usually easily demonstrated in fresh sputum. The diagnosis is commonly missed, not because the fungus is difficult to find or to identify, but because a fungal etiology was not considered and the appropriate examination was never made. Small particles from fresh sputum should be spread on a clean glass slide. A drop or two of 10-15 percent potassium hydroxide is then added to the material to clear debris. A cover slip is applied and examination is made with both low and high power magnification, using reduced light. The double walled, light refractile, 7-20 micron sized organisms are easily seen. When characteristic, wide pore budding is present the diagnosis is made and specific therapy may be started. Cultures should be made for more definitive mycological identification. Pus or exudates from available lesions should be examined in a similar manner. Prostate secretions readily reveal the fungus when that organ is involved, as it is frequently. Urine cultures often are positive when there is genitourinary tract blastomycosis. Bi-

opsy materials obtained by bronchoscopy or from skin, subcutaneous or bone lesions and processed with the customary fungus stains are usually diagnostic. Sabhi culture media has been very effective in growing the organism.

Management

All patients with blastomycosis require treatment with either amphotericin B or 2-hydroxystilbamidine. When the diagnosis is established subsequent to and as a result of a pulmonary resection, medical therapy would be instituted, even in those instances in which it appears the excision of the disease process is complete.^{6, 7}

Very recently it has been suggested that some acute blastomycosis cases are self limited and require no therapy. Several cases which appear to fall in this category are being closely followed.⁸ In view of the serious prognosis associated with dissemination, it presently appears wise to continue to treat all patients in whom the diagnosis is established.

REFERENCES

1. Furcolow, M.L., Chick, E.W., Busey, J.F., and Menges R.W.: Prevalence and Incidence Studies of Human and Canine Blastomycosis. *Am Rev Resp Dis.* 1970. 102 60-67.
2. Casad, D.E., Waldman, W.J., Levan, N.E., and Sorensen, R.H.: North American Blastomycosis in California. *Calif Med.* 1967. 106.
3. Sarosi, G.A., and Serstock, D.S.: Isolation of *Blastomyces dermatitidis* from Pigeon Manure. *Am Rev Resp Dis.* 1976. 114, 1179-1183.
4. Blastomycosis I. A Review of 198 Collected Cases in Veterans Administration Hospitals. *Am Rev Resp Dis.* 1964-89 659-652.
5. Busey, J.F.: Modern Concepts in the Diagnosis and Management of Pulmonary Mycoses. *Clin Notes on Resp Dis.* 14 NO4-Spring 1976 3-15.
6. McGee, G.E., Williams, H.D., and Campbell, G.D.: The Recognition and Management of Blastomycosis. *J Miss State Med Assoc.* 1976. 17 347-350.
7. Busey, J.F.: Blastomycosis III. A Comparative Study of 2-Hydroxystilbamidine and Amphotericin B. Therapy. *Am Rev Resp Dis.* 1972. 105, 812-818.
8. Sarosi, R.S., Hammerman, K.J., Tosh, F.E., and Kronenberg, R.S.: Clinical Features of Acute Pulmonary Blastomycosis. *N E J M* 1974. 290. 540-543.



*Obstetrics
and Gynecology*

The Onset of Labor

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INTRODUCTION

Despite numerous attempts to delineate the mechanism for the initiation of labor ("when the fruit is ripe it falls from the tree,") the stretch-strain hypothesis, Csapo's concept of a progesterone block preventing the onset of labor, this mystery of nature has yet to be solved. Through recent research it begins to look like there is a coherent explanation to this phenomenon in a variety of species including the human. Although there are some systematic differences between the mechanism in experimental animals and the human, evidence is beginning to appear in the Veterinary literature that may shed some light on this puzzle.

The Fetus

The first contribution to our understanding of the onset of labor concerns the fetus, specifically its pituitary and adrenal glands. Liggins became interested in studying the onset of labor in sheep, primarily because the sheep lack sensitivity to oxytocin and has no oxytocinase, making it relatively unique. He attempted to modify the volume of

Presented to Phoenix OB-GYN Society March 2, 1977.
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the intrauterine contents by decapitation of the fetus, replacing the fetus in the amniotic sac, and allowing the pregnancy to continue. However, fetal death and reabsorption occurred, but labor could not develop. He then tried to minimize the amount of fetal ablation that could be compatible with this prolonged retention of pregnancy. Removal of only the pituitary accomplished similar results. In preparations with the pituitary excised administration of ACTH to the fetus would promptly result in labor. If cortisol was given to an animal in which the fetal adrenal was absent, labor could occur within 2-3 days. In other species (cow, sheep, goat, and some rodents) it was also possible to initiate labor by giving cortisol. Within 2-3 days after injection labor would ensue, independent of the duration of gestation. Higgins concluded that, at least in those species, the fetal pituitary and adrenal were essential to the onset of labor. In addition, a spontaneous increase in fetal adrenal activity occurred, resulting in the production of fetal adrenal cortical hormone. This preceded the onset of labor by about 7-10 days. Also, by injecting either ACTH or cortisol, and giving progesterone simultaneously in large doses (200 mg/day) labor could be prevented, demonstrating the inhibitory action of progesterone. Cortisol does more than stimulate the onset of labor in those species that are sensitive. Premature sheep fetuses almost never survive; they just don't breathe. But in the studies using sheep given cortisol resulting in labor in 2-3 days, these labors produced sheep fetuses that lived. This was an early observation on the utility of cortisol to produce maturation of the enzyme systems that generate surface active material. Also, in many species, cortisol stimulates production of glycogen and insulin, and the pattern of thyroid hormone production is changed. In

these functions there does seem to be some overlap in terms of human experience.

However there are distinct differences with respect to the human. No burst of fetal adrenal activity occurs in the human fetus preceding the onset of labor. Human fetal adrenal cortical hormone concentration increases progressively during the last 5-6 weeks of pregnancy, but the cataclysmic secretion of cortisol is something that is unique to animal species.

Maternal Blood

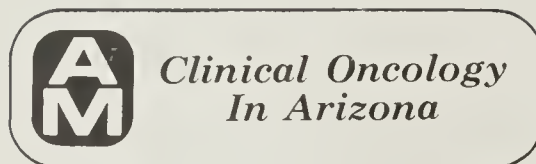
The concentration of progesterone and estrogen in maternal blood changes in a variety of animal species. In those species in which the onset of labor is induced by cortisol administration, an abrupt decrease in the concentration of progesterone in circulating blood follows. Progesterone functions, as Csapo described it, as an inhibitory agent by an obscure action. The placenta produces progesterone precursor (pregnenalone) from acetate. Pregnenalone is converted to 17-OH pregnenalone, which ultimately forms DHEA sulfate (the primary precursor to the excess estrogen produced during pregnancy). DHEA is capable of conversion to androstenedione, which in turn can form estrone. DHEA is also convertible by the placenta to testosterone, a common precursor for estradiol, etc. There are a large series of interactions all marked by reversible chemical reactions, all modified by systems of enzymes. Something is happening at the end of the sequence (progesterone occurs relatively early in the order of syntheses that deals with the production of steroid molecules from acetate; there is a change in the relative activities of the enzymes down through this system which results in the reduction of progesterone concentration). The principal reason for the decrease in

the amount of progesterone seems to be to reduce its inhibitory effect.

With respect to estrogen, that seems fairly straightforward. In those species which respond to it, cortisol serves to induce increased enzyme activity, thereby increasing the capacity for conversion of substrates into estrogen, markedly increasing estrogen activity.

Close similarities in human pregnancy exist. If one looks carefully at human and primate material, a reduction in progesterone and an increase in estrogen concentration is found in blood prior to the onset of labor. It appears over a period of 4-5 weeks rather than 1-2 days, as in the animal species that respond to cortisol. Nevertheless there are some striking similarities. What is the function of the increased estrogen activity? In those species that respond very promptly to it, two things occur: 1) it sensitizes the uterus by increasing the concentration of actin and myosin, the contractile elements in smooth muscle. However, this effect (increased general neuromuscular activity of the uterus) is inhibited by progesterone; 2) in those species that respond to cortisol, estrogen causes placental changes. The sheep placenta has 30-40 small "buttons" with tissues of maternal and fetal origin that interdigitate with, and are adherent to, one another. During the time of increased estrogen activity following administration of cortisone, these tissues separate easily. Under the electron microscope, disruption of the microvilli (which allow the cells to interdigitate) is observed. Some degeneration within cells principally on the maternal side of the sheep placenta can be seen. The increase in estrogen is the stimulus to dissolution and disintegration of some of the maternal cellular elements of the placenta, primarily the decidual cells.

To Be Continued



Clinical Oncology
In Arizona

Immunotherapy of Cancer

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Late in October 1976, we attended an international conference on the immunotherapy of cancer which was held at the National Institutes of Health (Bethesda, Maryland) under the sponsorship of the Tumor Immunology Program of the National Cancer Institute. The purpose of the meeting was to discuss and summarize the present status of immunotherapy of cancer in man. Particular emphasis was placed on review of the results of clinical trials (e.g., response, survival) as opposed to studies of nonhuman species or in vitro immunologic assays of patients with cancer. Although the conference will eventually be published as a detailed monograph, we feel that a brief summary for physicians in Arizona is appropriate. We must stress, however, that the opinions included here are our perceptions of important features of the conference and of the

unresolved controversies in the field.

Immunotherapy has had major trials, thus far, in two clinical settings with differing objectives: (a) *Adjuvant immunotherapy* has been tested in cancers for which excellent initial treatment is available (surgery, radiotherapy, and/or chemotherapy), but with which are associated a *high risk of later relapse*. In this setting, recurrence is thought to be due to small numbers ($< 10^3$) of residual tumor stem cells. Adjuvant immunotherapy is intended to eradicate the small number of remaining tumor stem cells by enhancing the patient's own humoral and cellular immunologic mechanisms. Success in such immunotherapy trials would be associated with a reduction in the relapse rate and with a break and plateau in the survival curve at a level higher than that observed with the standard treatment alone. (b) A second and more difficult setting for clinical trials of immunotherapy is that of *widely metastatic cancer*. In this setting, the objective measures of success are more modest (e.g., an increase in the complete or partial remission rate and prolongation of the remission duration or survival).

There are many potential problems in studying the effect of immunotherapy. Even if the agent might be effective there are usually major, unresolved issues of dose, route, schedule, and spe-

cific type of agents to be considered. The immunotherapeutic agents which have been studied to any significant extent in man for dose, route, schedule, or type of preparation, are primarily bacterial vaccines or non-specific immunostimulators (e.g., viable *Bacillus Calmet Guérin* [BCG] or its products, and non-viable *Corynebacterium parvum*). In some instances, specific tumor antigens (tumor cells, purified antigen) have been administered along with the non-specific vaccines. Of potential immunopotentiating or immunomodulating agent the antihelminthic drug levamisole recently entered large-scale trial whereas bovine thymosin (fraction V "immune RNA," and transfer factor remain as new approaches being tried by a few individual investigators.

Other problems in interpreting the results of immunotherapy trials in man are those associated with study design. We noted major deficiencies in several studies due to small numbers of patients, improperly selected control groups, poor "historical" controls, or control groups of patients with major differences in important prognostic factors that could conceivably account for the type of differences being reported. In the following sections we will summarize our opinions of the results of the studies in specific cancers and will attempt to point out apparent flaws in study design where appropriate.

Lung Cancer

Although lung cancer is notoriously refractory to standard approaches of treatment, a series of studies strongly suggested that such neoplasms may be responsive to combined modality treatment which includes immunotherapy. Dr. Martin F. McKneally of Albany Medical College (Albany, N.Y.) updated the results of a randomized adjuvant trial in which a single injection of intrapleural BCG was given to lung cancer patients after surgical resection. The trial continues to show a positive effect in Stage I patients. With a median duration of observation of 20 months, there have been 2 recurrences among 26 BCG patients, whereas there have been 9 recurrences among 32 control patients. The results of BCG therapy are equivocal in Stage II patients and negative in Stage III patients. A total of 95 patients have been entered in the trial thus far. Three other studies in lung cancer yielded similar results.

The least toxic approach to lung cancer immunotherapy involves the use

levamisole and was presented by Dr. Willem Amery of Janssen Pharmaceutica, Belgium. In this double-blind, placebo-controlled trial carried out in Belgium and The Netherlands, levamisole was administered as an adjunct to surgery in resectable cases. The drug was given at a constant dose (irrespective of weight). In a group of 76 patients weighing less than 70 kg, significant improvement in remission duration and survival was observed in the levamisole-treated group. The same trend appeared in each of the cooperating institutions in the trial. Amery speculated that the lack of therapeutic effect in patients weighing over 70 kg was due to insufficient dosage. The drug is now being administered according to weight.

Leukemia

Results of clinical studies of immunotherapy in acute leukemia do not appear overly encouraging. The leukemia studies (virtually all of which employ BCG of differing strains, doses, and routes of administration) were prompted by the provocative approach taken by Dr. Georges Mathé of the Institute of Cancerology, Villejuif, France, in 1963. At this conference, Mathé reviewed his more recent work as well as his original study in which immunotherapy was administered to 20 acute lymphatic leukemia (ALL) patients (who received either viable Pasteur BCG or pooled allogeneic leukemic cells or the combination) at various intervals after they had achieved complete remission. In Mathé's original study, chemotherapy had been maintained for 1-2 years prior to the initiation of immunotherapy. Results in these patients were compared to results in a second group of 10 patients randomized to continued chemotherapy alone. Extraordinarily, all 10 controls relapsed within 4 months (a pattern of relapse which has not been observed by other investigators), whereas 8 of the 20 who were maintained on immunotherapy are still alive. The result was unique, inasmuch as long-term complete remissions without relapse after discontinuation of chemotherapy occurred only rarely with the drugs and regimens then in use. In the ensuing years, many new drug treatment regimens and routine prophylaxis of CNS leukemia have been developed, and in various trials reported by others, upwards of 50% of children with ALL appear to stay in remission for 5 years or longer. Over the years, several large institutions and cooperative groups have attempted to confirm the results of Mathé's original trial

and, as reported at this meeting, they have not succeeded. Thus, it remains unclear whether immunotherapy offers any advantage to the results of many excellent programs for the management of childhood leukemia.

Several studies of immunotherapy using BCG or BCG plus leukemia cell vaccines in the management of adult acute myelogenous leukemia were also reported. Immunotherapy was employed during remission induction and/or remission maintenance in particular trials. It was clear that the effect of immunotherapy was not reflected by increased remission rates, but in more than half of the studies, patients who received immunotherapy along with chemotherapy manifested either improved survival or longer remission durations. However, there were carefully controlled trials in which no difference in favor of immunotherapy was detectable.

Lymphoma

Two large-scale randomized trials of BCG immunotherapy in lymphoma were also presented. Dr. Richard Bakemeier of the University of Rochester Cancer Center, Rochester, N.Y., reported on the Eastern Cooperative Oncology Group (ECOG) study of intradermal BCG for maintenance of remissions in patients with advanced Hodgkin's disease who had been induced into remission with combination chemotherapy. The Hodgkin's disease study has failed to demonstrate a beneficial effect of BCG thus far, but additional years of follow-up will be required.

We presented a preliminary analysis of a large Southwest Oncology Group (SWOG) clinical trial (over 500 patients) with advanced non-Hodgkin's lymphomas. In this ongoing SWOG trial, patients receive remission induction combination chemotherapy alone or along with BCG. Our report summarized the first 263 fully evaluable cases entered in the trial. Central histopathology review is accomplished for all patients entering the trial, and complete remission is documented by restaging. Patients with complete remissions are randomized for maintenance BCG immunotherapy or no further treatment. Thus far, the overall remission rate is significantly higher with the chemotherapy plus BCG induction treatment than with chemotherapy alone, and survival is somewhat better for patients with nodular lymphoma who have received chemimmunotherapy compared to chemotherapy alone. Although these

preliminary results are intriguing, much longer follow-up is needed for analysis of the entire study.

Melanoma

Considerable effort has been made with immunotherapy in early and advanced malignant melanoma cases, in part because of the observed regressions of melanoma nodules after intralesional injections of BCG and in part because standard treatment is relatively poor and new approaches are desperately needed. The results of large, historically controlled studies of adjuvant BCG immunotherapy used postoperatively for patients with positive lymph nodes were presented by Dr. Evan Hersh of M.D. Anderson Hospital. These studies showed somewhat improved survival with BCG in certain patient categories (e.g., trunk primaries) and negative results in others (e.g., head and neck primaries). Hersh indicated that paired matching to historical controls was good. A prior prospective randomized study, presented by Dr. Carl Pinsky of the Memorial Sloan-Kettering Cancer Center, New York, N.Y., which used smaller quantities of BCG showed no difference whatsoever in remission duration or survival in patients who received surgery alone or surgery with adjuvant therapy with BCG. A large, ongoing randomized trial presented by Dr. Donald Morton of UCLA, Los Angeles, is of particular importance in this regard. This trial, involving patients receiving sizeable doses of BCG alone or in combination with a melanoma cell vaccine after surgery, has not yet shown statistical superiority for adjuvant immunotherapy over surgery alone, although the trend favors the immunotherapy group. Morton intends to continue this trial until his independent statistical consultants can assure him that there is a difference between immunotherapy and no treatment after surgery.

Dr. Gianni Beretta of the National Tumor Institute in Milan, Italy, presented a progress report for the International Melanoma Study Group (IMSG) on a controlled trial of prolonged chemotherapy, immunotherapy and chemotherapy, or immunotherapy alone as an adjunct to surgery. Thus far, the data are preliminary, but they do suggest a longer disease-free interval in patients receiving adequate treatment with BCG alone or in combination with chemotherapy. These data will need re-evaluation after more cases have been studied and followed, but it would appear that

the prospective randomized trials of Morton and Beretta should provide definitive information on BCG immunotherapy in high-risk melanoma cases after surgery.

Studies of more advanced metastatic melanoma presented at this conference did not suggest that the addition of BCG, levamisole, *C. parvum*, or serotherapy improved the outcome over chemotherapy alone, and interest is therefore focused on the surgical adjuvant studies.

Breast Cancer

BCG, *C. parvum*, and levamisole have all had initial testing in advanced breast cancer patients, and all three agents show some promise in the studies reported. However, each of the studies has received some criticism in relation to study design, patient population, or adequacy of controls. As in adult leukemia, the major effect of immunotherapy in breast cancer appears to be reflected in improved remission durations or survival but not in the initial response rates to standard treatment (e.g., chemotherapy).

Colon Cancer

It appears unlikely that patients with advanced metastatic colon cancer have benefitted from available chemoimmunotherapy. Dr. Paul Engstrom of the American Oncologic Hospital, Philadelphia, Pa., reported negatively on a trial with BCG added to standard 5-FU therapy, while Dr. Charles Moertel of the Mayo Clinic, Rochester, Minn., reported negative results with the methanol-extractable residue of BCG (MER) added to a variety of 5-FU combinations as tested by the Gastrointestinal Cancer Study Group. This large study perhaps puts into perspective Moertel's earlier pilot work with MER alone where 3 partial remissions of metastatic disease were observed in some 30 cases treated. Advocates of MER immunotherapy, such as Dr. David Weiss of Jerusalem, Israel, were critical of such MER studies for using too much MER and urged that smaller doses be utilized. The only surgical adjuvant study to be reported was that of Dr. Giora Mavligit of M.D. Anderson Hospital (Houston, Texas). Results in 86 historical controls undergoing surgery over a 10-year period at M.D. Anderson Hospital were compared to results in 112 patients receiving 5-FU plus BCG or BCG after surgery at M.D. Anderson or other cooperating institutions. The two immunotherapy programs had equivalent results and, in both, results were superior to those in historical

controls. The major critique of this study was the adequacy of the control group with respect to prognostic factor matching, source, etc. A concurrent randomized trial appears warranted to confirm the efficacy of BCG activity as a colon cancer adjuvant.

Sarcoma

An evening session of this conference dealt with osteogenic sarcoma. While it was quite apparent that adjuvant chemotherapy has prevented the appearance of metastatic disease in a significant fraction of patients who have undergone surgical removal of the primary tumor, none of the attempts with adjuvant immunotherapy in this disease to date have shown any benefit. New studies employing adjuvant chemoimmunotherapy are underway.

General Considerations

While it is almost impossible to summarize a conference of this degree of diversity, several common themes did appear to emerge. First, immunotherapy as a sole adjuvant after surgery may have value in early lung cancer cases. Second, BCG, MER, and *C. parvum* used during induction therapy do not appear to increase the complete remission rate for any of the advanced neoplasms compared to that observed with a good chemotherapy regimen alone for the same tumor. BCG may increase the partial remission rate in lymphomas through a local effect, and local effects have previously been described for BCG in melanoma, breast cancer, and in various animal tumor model systems. Third, immunotherapy or chemoimmunotherapy maintenance administered after fairly good chemotherapy-induced remissions of cancer may be of some benefit. In most of the large trials there was some improvement in remission duration, overall survival, or both in patients who received immunotherapy. However, this effect was usually relatively slight and may not be directly attributable to effects mediated through the immune system. For example, frequent treatment (as is often practiced with immunotherapy) may provide more exposure to continuing medical care by physicians and nurses, which would favorably affect survival even though it would not directly affect remission duration. Thus, carefully controlled trials with adequate numbers of matched patients are still necessary to detect small (and probably important) effects of immunotherapy in patients with cancer. This new modality of cancer treatment shows definite promise.



Case of the Month

Case #22

Steven I. Walsh, M.D.

This 20 year old male was struck in the left flank while playing football. He went to the Student Health Service the same day because of pain in the traumatized area. No extensive work-up was done at the time and the pain subsided over the next four days.

He was asymptomatic for another three days, but then returned to the University of Arizona Health Sciences Center emergency room because of the sudden onset of severe left flank pain and generalized weakness. He denied gross hematuria. A peritoneal tap in the emergency room was grossly bloody. Arteriography of the spleen was normal.

A selective left renal arteriogram was then performed (Figs. 1. and 2.). What three major findings are visible? What is the most likely explanation for the findings?

Findings:

1. Spreading of vessels around an avascular mass in the mid-portion of the kidney. (Figures 1 and 2).
2. Flattening of the lateral aspect of the kidney, best appreciated in Figure 2.
3. Extravasation of contrast from a ruptured small arteriole. (See arrow Figure 1.) Answer on page 400.

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Gastric Pseudolesion Simulating Neoplasm Due to Splenic Anomaly

Alex Newman, M.D.

SUMMARY

The interpretation of filling defects in the gastric cardia and fundus resembling tumors may often be a perplexing problem. A case of simulated intra-gastric neoplasm due to an anomalous outgrowth of the spleen is presented. Although not performed in this case, splenic scintigraphy is recommended as a possible diagnostic aid in the investigation of the etiology in such gastric pseudolesions.

Introduction

The stomach is in relationship to the spleen, and consequently enlargements or anomalies of the spleen may cause distortions of the stomach simulating gastric neoplasm. The purpose of this paper is to describe a recent case in which an unusual anomaly of the spleen was found to be responsible for the production of a persistent filling defect in the gastric fundus resembling an intramural neoplasm.

Report of a Case

A thirty-seven year old woman was admitted to the hospital for investigation of complaints of epigastric discomfort of over one year's duration usually related to food intake. Occasional episodes of belching and nausea were also reported. The past history was non-contributory. Complete roentgenographic studies of the gastrointestinal tract had been made one year previously and were reported to be negative.

The physical examination was entirely negative except for some tenderness to palpation in the left costal margin. Laboratory studies including a complete blood cell count, urine analysis, stool examination, and an automated battery of blood chemistry determinations were all normal.

Upper gastrointestinal roentgenographic studies showed a persistent 3 centimeter filling defect in the fundus of the stomach (Figs. 1 and 2). The exact nature of this defect could not be determined, but it was felt that this persistent defect most probably represented a benign intramural gastric tumor, most likely a leiomyoma. Gastroscopy revealed a normal looking mucosa which



Figure 1.



Figure 2.



Fig. 1. Right anterior oblique film of the barium-filled stomach reveals a well defined defect (arrow) in the gastric fundus.

appeared to be pushed inward in the area of the defect. Biopsy at the site showed normal gastric mucosa. Exploratory laparotomy was advised.

Surgical exploration with gastrotomy was carried out. No intrinsic or intramural lesion of the stomach could be found. An outgrowth of splenic tissue arising from an otherwise normal spleen was in immediate relation to the greater curvature of the fundus of the stomach and was noted to indent the gastric wall.



Fig. 2. Multiple spot roentgenograms of the gastric fundus with various degrees of filling with barium demonstrate a persistent deformity.

From the Department of Radiology, Maricopa County General Hospital, Phoenix, Arizona

There was no doubt but that this indentation of the gastric wall was the explanation for the roentgenographic findings. The gastrotomy was then closed, and examination of the other intra-abdominal viscera was carried out. No significant pathology was found, biopsy from the splenic outgrowth was taken, the abdomen was closed, and the patient made a totally uneventful convalescence. Histologic examination of the biopsy specimen showed normal splenic tissue.

Discussion

The interpretation of filling defects in the gastric cardia and fundus can frequently be a difficult diagnostic problem. Many entities may simulate neoplasms of the gastric cardia and fundus. These may be divided into intrinsic lesions and extrinsic pressure deformities. Although extrinsic causes of simulated gastric lesions are, as a rule, much easier to evaluate from the standpoint of differential diagnosis than are intrinsic lesions, occasionally deformities of the stomach may occur that are certainly difficult, if not impossible, to recognize as non-neoplastic before surgical exploration.

Extrinsic benign causes of simulated cardia masses include impressions by the enlarged liver, heart, spleen, and tortuous aorta.^{7, 8, 12} Usually the spleen is grossly enlarged when it is the cause of such a deformity; however, cases of indentation of the wall of the gastric fundus by the superior tip of a normal spleen producing defects, clinically and roentgenographically indistinguishable from those of true intrinsic gastric neoplasms, have been reported.¹ Accessory splenic tissue also can produce filling defects in the adjacent stomach and may mimic a tumor.

Abnormal segmentation of the spleen is not infrequent embryologically and may result in accessory spleens. The German literature^{3, 4, 11} describes two types of accessory spleens, namely *lienes accessorii* which are entirely separate and usually lie in the folds of the greater omentum, the gastro-lienal ligament or the transverse mesocolon and *lienes succenturiati* which are connected with the main gland and appear as appendices. The former are more common, being found in 10 to 35 percent of human individuals^{5, 6} and are distinguished as separate organs with a separate vascular supply.⁴

Although most accessory spleens are located at or near the hilus of the spleen,

one of every 6 accessory spleens was found in the tail of the pancreas in the series of Halpert and Györkey;⁵ this information may be of practical surgical importance. Lesions affecting the main spleen because of its anatomic structure also usually affect the accessory spleen. Das Gupta and Busch² reported a case of an accessory spleen at the tail of the pancreas in a splenectomized patient producing gastric indentation resembling an intragastric neoplasm.

Lienes succenturiati, on the other hand, are found attached by a band of splenic tissue to the margin of a normal spleen and in all respects are an integral part of the spleen proper but merely represent outgrowths or appendages resulting from abnormal segmentation. This presented case represents the first in which such an accessory outgrowth from the spleen has been described as producing gastric indentation resembling an intragastric neoplasm. In retrospect, preoperative diagnostic acumen might well have been enhanced by splenic scintigraphy which indeed is recommended in the diagnostic investigation of filling defects presenting in the wall of the cardia and fundus of the stomach. McIntyre and Wagner⁹ and Potchen and Adatepe¹⁰ recommend splenic scintiscanning as a valuable procedure for detecting accessory spleens as well as for estimating the size, configuration and location of splenic tissue.

REFERENCES

1. Brown, R.B., Dobbie, Jr., R.P.: Splenic indentation of the gastric fundus resembling gastric neoplasm. *Amer J Roentgen* 81, 599, 1959.
2. Das Gupta, T.K., Busch, R.C.: Accessory splenic tissue producing indentation of the gastric fundus resembling gastric neoplasm. *New Eng J Med* 263, 1360, 1960.
3. Haberer, H.: *Lien succenturiatus* and *Lien accessorius*. *Arch Phys Anat* 47, 1901.
4. Hackl, H.: Über Vorkommen und Entstehung von Nebenmilzen. *Bruns' Beitr klin Chir* 198, 129, 1959.
5. Halpert, B., Györkey, F.: Lesions observed in accessory spleens of 311 patients. *Amer J Clin Path* 32, 165, 1959.
6. Hess, W.: Pankreas und Milz. In: *Klinische Chirurgie für die Praxis*, Vol. III, Diebold, H., Junghanns, H., Zuckschwerdt, L., Eds., Thieme Stuttgart, 1962.
7. Kaye, J.J., Stassa, G.: Mimicry and deception in the diagnosis of tumors of the gastric cardia. *Amer J Roentgen*, 110, 295, 1970.
8. Lame, E.L.: The gastric cardia and fundus. *Radiology* 75, 703, 1960.
9. McIntyre, P.A., Wagner, Jr., H.N.: Current procedures for scanning of the spleen. *Ann Int Med* 73, 995, 1970.
10. Potchen, E.J., Adatepe, M.: Liver and spleen scintiscanning with indium 113m. *Amer J Roentgen* 106, 739, 1969.
11. Schinz, H.R., Baensch, W.E., Frommhold, W., et al: *Roentgen Diagnosis*, 2nd Ed., Grune & Stratton, New York, 503, 1967.
12. Wohl, G.T., Shore, L.: Lesions of the cardiac end of the stomach simulating carcinoma. *Amer J Roentgen* 82, 1048, 1959.

Case #22

Subcapsular Renal Hematoma



Figure 3. Tomographic cut of left kidney from intravenous urogram demonstrating splaying of upper and middle infundibulum by an intrarenal mass which corresponds to that seen in Figure 2.

Discussion

Trauma to the kidney may result in collections of blood within the parenchyma, between the parenchyma and the fibro-muscular capsule, between the capsule and the perirenal fascia, or in the vicinity of the renal pedicle.

An intrarenal hematoma is manifested arteriographically as an avascular localized mass within the kidney. The outline of the kidney is usually normal. Flow may be slowed to the area and vessels may be attenuated.

Subcapsular hematomas compress the subjacent renal parenchyma and displace and flatten the collecting system. The renal capsule itself or the capsular arteries may sometimes be seen displaced away from the parenchyma on arteriography.

Perirenal hematomas result in displacement of the perirenal fascia away from the parenchyma and capsule. The parenchyma is not flattened. The hematomas tend not to tamponade the bleeding site as well as subcapsular hematomas.

Injuries to the renal artery are manifested on intravenous urography by delayed visualization or non-visualization of the affected kidney. Arteriography may demonstrate an intimal laceration or complete transection of the artery.

high slows or occludes flow.

The findings in this case (listed above) are best for combined intrarenal and subcapsular hematoma. However, this patient had an intravenous urogram (Figure 3) three years prior to his injury which demonstrated the same mass effect on the calyces as is seen exerted on the vessels in Figure 1. This emphasizes the importance of reviewing old radiographs in proper radiographic interpretation. This intrarenal mass effect was interpreted as a cyst. The extravasation of contrast was apparently from a vessel near the surface of the parenchyma and may be the source of the subcapsular hematoma.

The fact which needs most emphasis concerning collections of blood in and around the kidney is that they are frequently associated with some underlying abnormality of the kidney. Horseshoe kidney, marked hydronephrosis, adenocarcinoma, angiomyolipoma, pyelonephritis nodosa, and renal vein thrombosis all may predispose to abnormal collections of blood in and around the kidney. Furthermore, they may occur spontaneously and without trauma. Anticoagulation, sickle cell disease, and infarction secondary to embolization from atrial fibrillation or mural thrombus have also been reported to have the same effect.

In children 25% of the patients with significant injuries to the left kidney have coexistent traumatic rupture of the spleen.

Clinically, hematuria does not correlate with the degree of injury. Of the various injuries to the kidney, damage to the calyceal system is the one which usually requires surgery. This is manifested radiographically by extravasation of contrast from the calyces, as seen on intravenous urography.

BIBLIOGRAPHY

1. Lang, Erich K.: Arteriography in the Assessment of Renal Trauma. *The Journal of Trauma*, 15:553-566, 1975.
2. Meyers, Morton A., et al: Diagnosis of Perirenal and Subcapsular Masses. *American Journal of Roentgenology*, 121:523-538, July, 1974.
3. Pollack, Howard M., and Popky, George L.: Roentgenographic Manifestations of Spontaneous Renal Hemorrhage. *Radiology*, 110:1-6, January, 1974.
4. Tocci, Paul E., et al: Spontaneous Rupture of the Kidney Secondary to Polyarteritis Nodosa. *The Journal of Urology*, 113:860-863, June 1975.
5. Morse, Thomas S.: Renal Injuries. *The Pediatric Clinics of North America*, 22:379-391, May 1975.
6. McDougal, W. Scott, et al: Spontaneous Rupture of the Kidney with Perirenal Hematoma. *The Journal of Urology*, 114:181-184, August 1975.
7. Sickles, Edward A., and Korolkin, Melvyn: Perirenal Hematoma as a Complication of Renal Infarction in Sickle-Cell Trait. *American Journal of Roentgenology*, 122:800-803, December 1974.
8. Lang, Erich K.: The Role of Arteriography in Renal Trauma. *The Radiologic Clinics of North America*, 14:353-370, August 1976.



Special Article

A Pioneer in Surgery

Dr. Ignacio Chavez Medina, F.A.C.P.

EDITORIAL NOTE

Arizona Medicine has served as the official organ of the Medical Society of the United States and Mexico since its organization about 24 years ago. We are pleased to present a paper from the recent meeting of this society in Mexico at Puerto Vallarta in November, 1976. This society has now 2,000 American and 500 Mexican doctor members.

This meeting brought together Dr. Ignacio Chavez Medina of Guadalajara, Jalisco and Dr. Ignacio Chavez Sanchez of Mexico City. Dr. Ignacio Chavez of Mexico City is director of the Instituto Nacional de Cardiología de México, a man who pioneered cardiology in Mexico City. Dr. Ignacio Chavez of Guadalajara on the other hand, is a surgeon of world-wide reputation, an honorary member of the American College of Surgeons, and a physician who pioneered surgery for 50 years in Guadalajara.

It has always been considered bad taste to speak of oneself, therefore I shall endeavor to lighten the subject as much as possible, by relating some of the experiences lived during my long profes-

sional life in the field of surgery.

I was 21 years old when I was graduated. My scanty success in the field of surgery, which was the only one that interested me, may be assumed. Fortunately I was called for military service with the grade of Major and with many promises of advancement I was incorporated into the Military Hospital of Guadalajara under the orders of Colonel Cendejas, who assigned me to the surgical service. This appointment, together with a Majors salary, opened my horizon, but this well-being lasted only three months, when I was ordered to the state of Michoacan and incorporated in a battalion commanded by Colonel Malpica. Our headquarters was Yurecuaro but we were constantly being moved to Zamora, Los Reyes.

As a doctor I had a practical male nurse assigned to me, but we totally lacked any equipment and had to use our ingenuity to obtain the indispensables for our treatments, such as gauze, bandages and iodine. The wounded, of whom we received many, were immediately transferred to the nearest hospital. Surgical interventions were not

even considered; we lacked everything.

I was next ordered successively to various divisions, under the orders of General Albañes, General Estrada and finally incorporated in the division of General Dieguez, the Chief of Staff being General Allende. General Dieguez had been a school mate of mine in the Liceo de Varones and was a personal friend. Needless to say, my situation improved in every way, so much more as General Dieguez became interested in me and especially in my professional career.

Aware of my youth and inexperience and realizing that I could not be a prophet in my own country, I enlisted in the French army through the Consul of that country. I was about to leave for France with a conditional permit from General Dieguez, who by that time was all mighty, when in 1917 the United States entered the war. Professor Albert J. Ochsner offered me a post as his assistant in the Augustana Hospital in Chicago. I immediately accepted and cancelled all my arrangements with the French Consulate.

I must remark that my military activities aside, which undoubtedly served to forge my character, I did not sever my connections with my Alma Mater and the Civil Hospital of Guadalajara where I attended at every available opportunity.

I shall never forget the impression I received by the surgery that was practised in the Civil Hospital and the private institutions at that time: hysterectomys and minor plastic repairs; hernias, amputations, draining of hepatic abscesses; a few Cesareans almost always fatal with the practice of the Le Port operation, which left the womb outside of the abdominal cavity; emptying of the mastoid: I recall a chief of Pediatrics who assigned an assistant to tell him when the child's face became twisted due to the severing of the facial nerve so he could continue the emptying with no more problems.

To summarize, surgery in Guadalajara, as in the rest of the country, was in swaddling clothes. The only anesthetic used was chloroform with its high incidence of cardiac and respiratory complications, most of which were fatal.

When I arrived in Chicago in April 1917 and until I learned something of the language, I was named chief of the hospital clinical laboratory. I knew absolutely nothing in this field, not even how to make a blood count, but my pride would not permit me to confess my ignorance. Incognito I went to a nearby hos-

pital to study and learn the routine of laboratory work, including the preparation and pathology of the specimens collected during the week, so as to present them each Sunday at the famous Sunday School presided over by Professor Ochsner and all the members of the staff. This was for me one of the most rewarding experiences, aside from being work that intrigued me and that I liked from the beginning.

After these activities, when I could understand and be understood in English, I went to the operating room as Head of Anesthesiology.

The anesthetic was ether administered by open drop until cyclopropane gas was introduced. During the period that remained in this service I administered an average of 20 anesthetics daily. The experience I acquired proved invaluable in my surgical activities.

I must mention my astonishment when I entered the surgical service of the Augustana Hospital to find that an average of 20 surgical interventions was practised daily, not counting emergencies. Above all to observe the type of surgery ordinarily practised and the routine use of blood classification and transfusion, about which I knew nothing. Interventions on the stomach (gastroenteroanastomosis) for treatment of ulcers; surgery of the gall bladder, intestines, brain and a large number of goiters of which as a general practice 3 or 4 were operated daily; and gynecology of all types.

After three years in the Augustana Hospital and previous postgraduate studies in the University of Chicago, I presented my State Board examination and considered my training terminated.

Doctor Frank Smithies, ex-gastroenterologist of the Mayo Clinic and Professor of Medicine at the University of Illinois, offered me a post as associate in his clinic to perform the surgery. In this manner I initiated my surgical practise in the United States. I render tribute of friendship and recognition to Doctor Smithies.

After successfully practising surgery in Chicago for almost four years, family matters called me back to Guadalajara, where I immediately resumed my professional activities. I was appointed Professor of Pathological Anatomy and after three months Professor of Obstetrics, a phase of the profession for which I had no inclination. Shortly afterwards, being director of the Civil Hospital, I went to the Gynecological Clinic and upon the death of Doctor Campos Hunhardt, was

his successor as Professor of Clinical Surgery and Chief of the Department of Surgery.

Previously I had discharged the post of president of the Health Department, position then related to politics, for which I had never felt any attraction. I still keep an official letter that my old friend then Governor Zuno, sent me by special messenger, informing me that "in the interests of public morality, I was dismissed from the post of President of the Superior Health Council," (without further comment). Upon the cessation of the political differences between my brother, a congressman and the Governor, I was again offered the post, which I categorically refused.

When I returned to Mexico I observed that small blood transfusions of 10 or c.c. were being administered using large syringes, ignoring completely the classification of blood types with the consequent dangers to which the patient was being exposed. As a result of a talk on this subject before the Medical Society I explained the Moss classification and for the first time in this country practised blood transfusion by means of paraffin tubes using the Percy-Brown technic.

Almost simultaneously I performed the first goiter operation in Mexico; followed by the first gastrectomy and operation on the biliary tract. On being appointed Chief Surgeon of the Southern Pacific Railroad of Mexico as it was then called, I was forced into orthopedics, specialty then non-existent. I hope it will not be considered presumption on my part, but the lack of specialization offered me great opportunities, as Doctor de la Cueva can confirm. I even went into the brain extirpating a glioma; resected compressive tumors of the spinal cord, etc. It was necessary for someone to attack these problems.

Upon being appointed Director of the Civil Hospital, a duty which I performed for seven years, I resolved to initiate reconstruction of the hospital. With the approval and goodwill of the Governor of the state, Margarito Ramirez, we started the reconstruction of the ancient building that Friar Antonio Alcalde had willed to "suffering humanity." It was slowly revested in white. The unedifying inscriptions that had been written at the head of each bed in the long bare ward disappeared forever. Inscriptions such as "remember that you are mortal" "Your final judgement is at hand"; "Be aware that you have to pay for your sin and that there is a Hell." How little,

anything, did our precursors know of the importance of the mental state in the evolution of an illness. For them the important factor seems to have been a preparation for death and not for a cure.

The first order I gave when I became Director of the hospital, was to prohibit the use of Chloroform and began the use of ether by the open drop method. Consequently respiratory and cardiac syncope almost disappeared, especially when oxygen was used simultaneously.

In 1933 I was invited to join the Mexican Academy of Surgery, where I presented a paper on Cushing's Disease created by resection of the adrenal gland, an operation that later when Cortisone was available, I used in treating carcinomatosis with excellent survival results. This paper was inspired by Professor Lester Dragstedt of the University of Chicago.

In 1943 I performed the first vagotomy with gastroenteroanastomosis. To date this is the favored procedure in the treatment of duodenal ulcer, modified by the pyloroplasty (Weinberg type) instead of the anastomosis. Unfortunately in our practise here, numerous cases subjected to this treatment present as a sequela the "dumping" syndrome or rapid emptying. I firmly believe that this is due to lack of experience or ignorance on the part of the surgeon, who cuts the pyloric sphincter, prolonging the incision excessively, leaving the stomach or mouth too large. I believe it valuable for the active surgeons to thoroughly study this point and report their cases of "dumping" and suggest means or technics to prevent this sequela. In so far as I know, to the present time, no single report has been submitted, which gives the impression that the surgeons are trying to hide these cases for fear of losing prestige.

In 1964 I retired from active practise and closed my consulting rooms, because of faulty vision due to cataracts, which were operated with all success. At present my vision is completely normal.

In 1969 I received one of my most appreciated honors upon being named an Honorary Member of the American College of Surgeons.

At present I am dedicated to the study of Philosophy which attracts me immensely. At the same time I have become a sort of psychological counsellor, profiting by the experience of a long life, which can be acquired in only one manner, by living and experiencing. As one of my favorite philosophers, Kierkegaard expresses the phrase I frequently quote, "Life is lived forward and only understood backward."



Vasodilator Therapy in Coronary Artery Disease

PART I

W. David Hager, M.D.

Editors: Jay W. Smith, M.D., Associate Head, Department of Internal Medicine, Chief, Section of General Medicine, University of Arizona College of Medicine, Tucson, Arizona 85724; Robert Hyland, M.D., Assistant Professor, U of A, College of Medicine, Assistant Chief of Medicine, Veterans Administration Hospital, Tucson, AZ 85723.

Introduction:

The prognosis of a patient with an acute myocardial infarction or chronic ischemic cardiomyopathy is a function of the amount of remaining viable myocardium. In the setting of an acute infarction, hemodynamic deterioration may occur during the first 24 to 48 hours. This suggests that the size of the infarct increases with time. To improve survival and preserve ventricular function, ischemic cardiac muscle must be salvaged. There is evidence that infarct size can be decreased by reducing the cost of cardiac work and improving the delivery of oxygen to ischemic areas. On the other hand, if the myocardial demands for oxygen exceed the supply, ischemia increases and failure ensues. Vasodilators decrease both peripheral venous and arterial tone. Clinical results with this therapy are determined by the balance of these actions as well as by the effect of this class of drugs on the coronary circulation. This review will examine these actions and assess the role of vasodilators in managing coronary artery disease.

PHYSIOLOGIC MECHANISMS

MAINTAINING CARDIAC PERFORMANCE:

The factors determining myocardial oxygen consumption are the heart rate,

the contractile or inotropic state of the heart, left ventricular systolic wall tension or afterload, and end diastolic fiber length or preload. During an acute myocardial infarction, myocardial oxygen demands increase. Inflammation and fever accelerate the heart rate. Cardiac contractility is depressed, resulting in increased left ventricular wall stretch. Ischemia causes pain, leading to an outpouring of catecholamines which in turn increase the peripheral resistance and precipitate tachyarrhythmias. The heart may be required to perform more work during an infarction than in the resting state. When the heart cannot maintain the output necessary to meet these increased demands, it fails.

Left ventricular systolic pressure is a function of impedance or resistance to forward flow. The pressure developed determines the left ventricular wall tension or afterload. If impedance increases,

COURSE IN ACUTE MYOCARDIAL INFARCTION

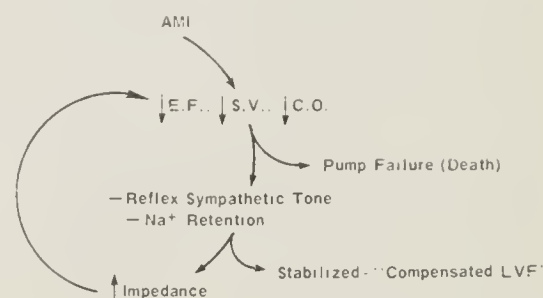


Fig 1

the left ventricle must work harder and expend more energy to maintain a given stroke volume. In the normal heart, myocardial fiber shortening adjusts appropriately to maintain stroke volume. The ischemic myocardium is unable to adapt to an increased impedance, and in an effort to sustain stroke volume, the left ventricle dilates and stretches the end diastolic myocardial fiber length. This dilation increases overall wall tension and increases oxygen consumption for a given stroke volume.¹

During an acute myocardial infarction

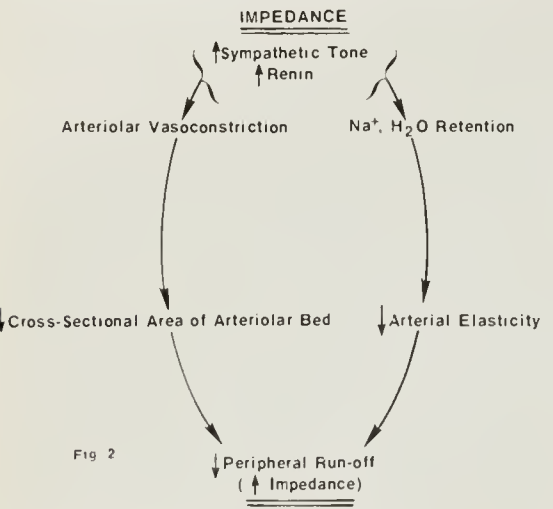
From: Arizona Health Sciences Center, University of Arizona College of Medicine, Veterans Administration Hospital, Tucson, Arizona

Presented February 2, 1977. Dr. Hager, Asst. Professor of Medicine, Dir. of CCU, VAH.

tion, a vicious cycle may develop so that failure may beget failure. Ischemic muscle may become infarcted tissue, and eventually cardiogenic shock and death ensue (Fig. 1).

Impedance:

Several factors influence the resistance to left ventricular ejection. Elevated catecholamine and renin levels promote arteriolar vasoconstriction. This



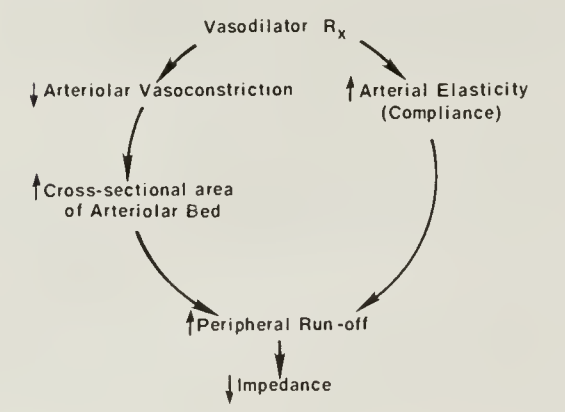
decreases the cross sectional area of the arteriolar bed and diminishes peripheral run-off. Interstitial fluid accumulation further compresses the arteriolar bed, and sodium and water retention also depresses arterial elasticity.¹ (Fig. 2)

Vasodilators decrease impedance by acting directly on smooth muscle in arterial walls (Fig. 3). Peripheral run-off is increased by the action of these drugs since they reduce arteriolar vasoconstriction and cause arterial relaxation. With decreased impedance, left ventricular systolic wall tension is less, ejection fraction increases, and forward flow is greater. Therefore, the drop in resistance to left ventricular ejection enhances stroke volume, and the resulting improvement in cardiac output may increase renal perfusion permitting a diuresis and mobilization of interstitial fluid.

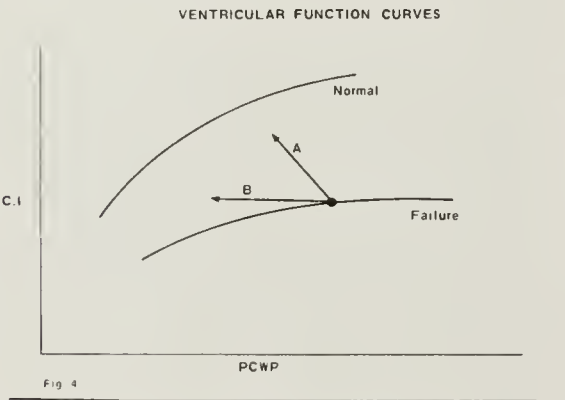
Venous Capacitance:

On the venous side of the circulation, the smooth muscle relaxation from vasodilator therapy expands the capacity of the venous bed. Venous return is reduced, leading to a smaller end-diastolic volume and therefore a shorter end diastolic myocardial fiber length. A tourniquet or phlebotomy has a similar effect. This reduction in preload lowers myocardial oxygen demands, but if the increased venous capacitance decreases end diastolic volume to the point where the left ventricle is hypovolemic, then stroke volume falls and a tachycardia develops to maintain the cardiac output.

EFFECT OF VASODILATOR R_x ON ARTERIAL SYSTEM




Forrester et al. have shown that left ventricular filling pressure or pulmonary capillary wedge pressure reflects the end diastolic volume but that the relationship is not linear.² If the wedge pressure falls below 12 to 15 mm Hg when the ventricle is ischemic, it is possible that the end diastolic volume will be insufficient to maintain stroke volume.



Ventricular Function Curves:
Left ventricular function may be graphically displayed by plotting cardiac index against pulmonary capillary wedge pressure (Fig. 4). The normal heart improves its performance when the wedge pressure or filling pressure increases. The function of an ischemic myocardium is depicted by a lower curve with a flatter slope. Increasing the filling pressure may lead to little change in cardiac index. In Fig. 4, Arrow A depicts a shift upward and to the left on the plot of cardiac performance against filling pressure and describes better myocardial function at a lower filling pressure. A vasodilator affecting both preload and afterload may explain this type of change in ventricular function. The horizontal shift to the left illustrated by Arrow B also denotes improvement in that the same cardiac work is accomplished at a lower cost. A vasodilator altering only preload may account for this type of change in myocardial performance.

To be continued



Correspondence

Dear Dr. Kennedy:
We were delighted to receive the recent memo indicating that a maximum of 20 references will be published with each original article in *Arizona Medicine*. We strongly feel that inclusion of appropriate references is an important part of original articles and therefore, will help in soliciting manuscripts for the journal.
We greatly appreciate the reconsideration of the initial plan to delete references. Lynn Taussig joins in sending his regards.

Sincerely,
William C. Weese, M.D.
Robert J. Clark, M.D., F.A.C.P.

Editor:
Proper reply when mom begged dad to see old doc, dad told her, "Let me be! No practicing physician, dear, is practicing on me!"
My mom replied, "Have it your way - go to your narrow bed! Your epitaph will read, my dear, HERE LIES A DUNDEE HEAD!"

Harry Epstein

- Answers to Hospital I.D. Quizz page 377.
- Figure 1—Good Samaritan Hospital early 1900s.
- Figure 2—Prescott V.A. Center early 1900s.
- Figure 3—St. Mary's Hospital, Tucson, 1897.



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Contributions: The editor sincerely solicits contributions of scientific articles for publication in *Arizona Medicine*. All such contributions are greatly appreciated. All will be given equal consideration.

Material submitted for publication in *Arizona Medicine* should conform to the following policies:

1. Manuscripts, including references or bibliography, should be typewritten, double-spaced, on one side of the paper only, and the original and a copy enclosed.
2. Be guided by the general rules of medical writing as followed by the *Journal of the American Medical Association*.
3. Although the Editors try to catch inaccuracies the ultimate responsibility is the author's.
4. Articles are accepted for publication only if they are contributed exclusively to this Journal.
5. Ordinarily, contributors will be notified within 60 days if a manuscript is accepted for publication. Every effort will be made to return unused manuscripts.
6. The Journal reserves the right to edit all material.
7. Reprints will be supplied to the author at printing cost.
8. Bibliographies will be limited to 20 references. Additional references subject to review by the editor.

Among all of the alphabet soup that's currently in use, OSMAP probably does not ring a familiar bell to most of you. It's the abbreviation for the Organization of State Medical Association Presidents. Membership in the organization is extended to the President-Elects, Presidents, and immediate Past-Presidents of the fifty State Medical Associations. OSMAP meets twice a year on the day before the opening sessions of the AMA House of Delegates. This month your Arizona representatives are in San Francisco attending the spring Conference of OSMAP.

The objectives of the Organization of Presidents of State Medical Associations are:

- (1) To exchange and discuss information and opinions regarding mutual problems in the administration of state medical associations in order to promote better understanding and more efficient discharge of the responsibilities of the office of president of the associations from which its members come.
- (2) To keep its member presidents informed on all medical issues of local and national importance, to disseminate this information to the best of its ability, and to offer its services freely in whatever areas they may be needed.
- (3) To propose courses of action which may improve activities and aid in resolving mutual problems of state medical associations.
- (4) To report to the AMA problems peculiar to the administration of state medical associations, and to report problems and policies of the AMA to the governing councils and officers of state medical associations.

Your President-Elect and President attend the two American Medical Association Annual meetings as part of the Arizona Delegation. We arrive one day ahead of the rest of the delegation to attend this most educational program. It is probably one of the most productive functions in which we engage because it offers the State Society leadership an opportunity to learn of new and innova-

MICA Status Report

tive things that other states are doing. Many of our ARMA programs have doubtlessly been generated from this activity.

The afternoon programs of this session usually involve round-table discussions. Last fall in Philadelphia we considered such subjects as: the problem physician, CME, malpractice solutions, Society membership, H.S.A. and PSRO, Counter Suits, and Government Intrusion in Medical Practice. Many worthwhile ideas were developed in these panels.

The thing that impresses me most from the OSMAP meetings is the fact that we in Arizona have been innovative and aggressive in our planning; and consequently, are much further advanced than many state societies. Continuous Medical Education requirement, which we have had for several years, drew a lot of interest; and of course, we from Arizona could describe our program. The same was true of Malpractice Legislation—we have accomplished much more in a single package than any other state. One very populous northeastern state with several medical schools is beginning to think about letting those young up-start physicians in medical school and training programs join their society; which of course, we in Arizona have done for several years. One state is still hassling their Blue Cross-Blue Shield plans about Usual and Customary Fees.

The conclusions that have been obvious to me from my attendance at the OSMAP meetings are that we should take real and justifiable pride in the Arizona Medical Association. We should be thankful to the AMA for providing this educational forum, and we should be thankful to our past leaders for bringing these ideas back to us and carrying them through to fruition. We need and hope to continue this in the future in order to maintain our progressive growth and strength as a viable society, which we need to do in order to be the spokesman for the health needs of the patients of Arizona.

John F. Kahle, M.D.
President, Arizona
Medical Association

Since our first special meeting with one member, your MICA board has worked diligently many hours to create and maintain a strong and stable company that will serve all the health care providers of the state.

We are proud to have been requested by the director of insurance to furnish risk prevention and loss control programs for hospitals in the state. This certainly demonstrates how MICA is appraised by the Arizona Department of Insurance.

But at the present time, we still are working on many things and have much more to do.

1. New rates for 1977 for all licensed health providers have to be determined and submitted for approval to the director of insurance.

2. Meetings have been held with representatives of ARMA's underwriting committee and representatives of the MICA board. It is our hope that desirable recommendations will be forthcoming as to the composition of the committee's standardization of procedure and guidelines, and efficiency of operation. This has been initiated.

3. The MICA bylaws which were created prior to the actual operation of the company were written with the primary concern of compliance with the Arizona statutes. These bylaws need to be reviewed with possible modification from time to time. The board would welcome volunteers from the members to serve on such a review committee.

4. We have finally obtained permission to look at the closed claim statistics of Travelers so that we will actually know more of where and how the claims have arisen so that any classification review will be based on hard data of Arizona experience, rather than through experience elsewhere.

5. We hope to establish reduced rates for part time physicians and reduced rates for young doctors just starting out.

6. Payment of the subordinated notes in quarterly installments without interest similar to the premium payments

is on the agenda for our next meeting the board.

7. Assist ARMA with a support action committee to give general and detailed help to all who are threatened or have a claim instituted against them. The first seminar was just held last week attended by representatives from the various parts of the state. The report I have received to date is that the subjects covered were most enlightening and instructive and there is great enthusiasm for the program.

8. Incorporate countersuit expenses in our coverage and set up the mechanism needed.

9. Establish loss control programs for hospitals and circularize preventive programs for doctors.

10. Keep abreast of re-insurance availability and explore coordination with developing AMA programs.

11. Assist our defense attorneys with peer review of their track records.

12. Establish and recommend rates for renewal coverage and new members to the director of insurance.

13. Work with the IRS to finally obtain decisions affecting the tax status and payment schedules of the subordinated notes.

Your company faces new concerns which certainly reflect the concerns of all of us that render medical care.

The Medical Liability Commission at their last meeting at which time they voted to go out of business on March 1st stated that Arizona ranks first in the percentage of medical injury claims which result in some sort of monetary payment, either by court action or by out of court settlement—over 78%. This certainly needs looking into—both as to verification and to determine the factors involved.

We ask for your continued confidence in MICA and its board to act responsibly and to maintain a financially sound and strong company in the present climate which still makes malpractice coverage volatile and a risky business.

We appeal to any member or group that has any problems to appear before the board in order that we may discuss the problem.

We feel that rather than be successful because we are the only game in town, we are the only game in town because of our success.

This report has been edited to conserve space. The complete report can be obtained from the ARMA office.

Jack E. Brooks, M.D.
President, Mutual Insurance
Company of Arizona

The AMA — ABA Malpractice Shoot-Out

This by-annual fracas had its last encounter in San Francisco in March. This reporter is not an aficionado of AMA sporting events, the first and last AMA event I attended was at the Kansas City stockyards in 1934. The exposure didn't take and the aroma persists.

So here we were in a Snobby Hill Hotel gathered to hear the latest about this malpractice pay off. Even the lawyers admitted that the performance was less than inspiring.

Those who consider that the malpractice crisis is past might ponder the fact that in 1960 the nation wide malpractice premium amounted to *sixteen million* dollars, in 1976 the malpractice premium cost was *two billion* dollars. Since one-third of the premium dollars is all that ever reaches the patient, this is quite a rip off and you can explain it any way you want.

The money is not only a loss and cost to the public in the form of added medical cost but when you add all of the unnecessary tests and studies which we do in the practice of so called "defensive medicine" all of this adds up into an unnecessary drain on the public exchequer. The fact that we in the profession maintain, and with good reason, that we have the finest medical system in the world, this doesn't make much of an impression upon the public who reads about our beloved professional associates who receive the hundred thousand dollar a year award for their beneficent care of HEW beneficiaries.

The legal fraternity doesn't foresee any change in their training in the near future for the certification of lawyers

who are especially trained in medical malpractice. It remains an open sesame, come one, come all, institute a suit.

The old 'locality of standard care' which was used in courts that you could flub dub all you wanted as long as the flub dub was considered good practice in your community, this no longer holds as most of us are aware. You must meet the national standard of care; and there is an effort, in some courts, to prevent any witness, professional witness, from testifying who is not actively in practice in the medical field in which he is testifying. This might prevent some of the journeymen, our brethren who travel from state to state and offer their services as expert witnesses for a price, on either side for a fee.

In general, medical review panels, which are thought to be a step forward, one form of this panel system is in vogue here in Arizona, most all agreed that these were useful but there has been no test of their constitutionality so that their future is at the mercy of whoever chooses to spend the money to challenge them in the higher courts. As most of you know the Illinois Supreme Court has struck down arbitration, that is compulsory arbitration in the state of Illinois.

There are nine states which limit the amount of recovery, Idaho for instance has put a \$150,000 limit, it too has not been challenged in higher courts.

One of the more interesting sessions of this less than exhilarating meeting, was by Dr. Mattox reporting on the New York State Self Insurance Plan. Each physician put up \$1,700.00 to start their

reserve and their reserve now is twenty-eight million dollars. They have their overhead cost down to five percent; twelve to twenty-five percent is the overhead cost in commercial insurance. It is truly non-profit, it yet may have court hurdles to overcome but so far it seems to be doing well.

One of the more scholarly papers dealt with the health care social revolution and this can be termed "the Second American Revolution." It is characterized by the changing attitudes towards all institutions such as the family, the government, the economic system, the whole bit is undergoing scrutiny.

He attributed the causes to the scientific and technological revolutions during the past century and to the evolution of the American dream. This speaker thought our affluence has led to a demand of perfection in everything in life including health care.

He suggested that our great difficulty in working through this revolution is the fact that all of the systems with which we are dealing are more or less biologic in nature, as is man himself, and that biologic changes are ill understood and yet we want to solve them all with technology and computers.

Finally the last day the trial lawyers were there in force and the thrust was the same old bit, they are protecting the patient from bad medical practice, and securing awards for those who are injured by such practice.

Then the discussion turned to what the possible Supreme Court judgements may be concerning professional advertisement.

It was the unanimous opinion of all these learned gentlemen that there would no longer be the "closed shop" type of control of professional ethics by the two professions that had prevailed heretofore and that some sort of advertisement would be allowed.

I suppose the avantgarde sector of our local medical community has already secured the services of some prominent Central Avenue advertising agencies. Stating that they are professional relations consultants or some other high sounding name, but it will be all the same and will come out something like "See Dr. Zilch, he is supreme at lifting the bags from any sex."

"Dry Gulch Jake"

J. W. Kennedy, M. D.



ArMA Reports

THE MINUTES APPEARING IN THIS SECTION HAVE BEEN EDITED TO CONSERVE SPACE. A COMPLETE COPY OF THE MINUTES OF ANY MEETING WILL BE MAILED TO ANY MEMBER REQUESTING THEM.

FINANCE COMMITTEE

The meeting of the Finance Committee of the Arizona Medical Association held at 810 West Bethany Home Road, Phoenix, AZ on Saturday, February 12, 1977 convened at 10:14 A.M., John T. Clymer, M.D., Treasurer and chairman presiding.

CASH RECONCILIATION TO BUDGET

Mr. Sherald Griffin reviewed the process by which our 1978 budget is reconciled to the cash flow projection as follows:

Income from All Operations
per 1978 Budget \$156,725.00

ADD:

Depreciation not requiring
a cash outlay 12,000.00

DEDUCT:

Payments per
Retirement
Agreement 6,000
Acquisition of
fixed assets 5,000 (11,000.00)

Cash generated from 1978
Operations—Projected \$157,725.00
Projected cash balance
(overdraft), Dec. 31, 1977 (150,270.00)
Projected cash balance
(overdraft), Dec. 31, 1978 \$ 7,455.00

1978 BUDGET

The committee reviewed the entire proposed budget item by item making a number of changes in the process.

IT WAS MOVED AND CARRIED TO RECOMMEND TO THE BOARD OF DIRECTORS THE FOLLOWING BUDGET FOR 1978.

CONDENSED STATEMENT OF REVENUE AND EXPENDITURES GENERAL DEPARTMENT

Revenue \$654,300.00
Expenditures 495,540.00
\$158,760.00

COMMITTEE DEPARTMENT

Revenue \$ 80,265.00
Expenditures 96,000.00
\$ (15,735.00)

ANNUAL MEETING

Revenue \$ 63,300.00
Expenditures 53,950.00
\$ 9,350.00

PUBLISHING COMMITTEE

Revenue \$ 75,340.00
Expenditures 75,040.00
\$ 300.00

BUILDING OPERATIONS

Revenue \$ 52,150.00
Expenditures 48,100.00
\$ 4,050.00

BENEVOLENT & LOAN OPERATIONS

Revenue \$ 2,000.00
Expenditures 2,000.00
\$ - 0 -

TOTAL ALL OPERATIONS

Revenue \$927,355.00
Expenditures 770,630.00
\$156,725.00

GENERAL DEPARTMENT

STATEMENT OF REVENUE AND EXPENDITURES

REVENUE

401 AMA Commissions \$ 6,000.00
403 Dues—Active Members 556,000.00
404 Dues—Interns
& Residents 500.00
406 Dues—Service Members 1,000.00
420 Printing Income 70,000.00
421 Sale of Supplies 800.00
429 Other 20,000.00
\$654,300.00

EXPENDITURES

501 Auditing \$ 5,000.00
504 Dues, Subs., Contrib. 2,600.00
505 Equip., maint. & rental 24,000.00
507 Gen. Overhead
(Recovery) (4,400.00)
508 Insurance, general 38,000.00
509 Insurance, health 7,500.00
510 Legal 16,000.00
511 Meeting 25,000.00
512 Miscellaneous 1,000.00
513 Payroll Taxes 14,340.00
514 Postage 10,000.00
515 Printing, general 6,500.00
516 Refunds, AMA
& ArMA Comm. 12,000.00
518 Salaries 226,000.00
519 Supplies 8,000.00
520 Telephone 12,000.00
521 Travel 17,000.00
522 President's expense 5,000.00
525 Printing Department 70,000.00
\$495,540.00

Excess of Revenue
Over Expense \$158,760.00

COMMITTEE DEPARTMENT

STATEMENT OF REVENUE AND EXPENDITURES

REVENUE

431 CME Processing Fees \$ 265.00
432 MICC Assessment
& Contrib. - 0 -
433 MICA Commissions 80,000.00
Total Revenue \$ 80,265.00

EXPENDITURES

500A Articles of Inc./
Bylaws - 0 -

500C Data Coll. & Analysis - 0 -
500D Board of Directors 2,900.00
500E Executive 1,500.00
500F Finance 500.00
500H Grievance 200.00
500I History & Obituaries - 0 -
500J Maternal & Child
Health Care 3,000.00
500K Health Manpower 2,500.00
500L Legislative 10,000.00
500M Medical Education 3,000.00
500N Medical Economics 3,000.00
500O Occupational Health - 0 -
500Q Professional 1,600.00
500R Public Relations 22,000.00
500S Government Services 1,000.00
500U Ad Hoc—Housestaff 3,000.00
500W Woman's Auxiliary 2,400.00
500X Physician's
Rehabilitation 400.00
500Y Professional
Liability Review 39,000.00
500Z MICC - 0 -
Total Expenditures \$ 96,000.00
Excess of Expense
over Revenue \$ (15,735.00)

ANNUAL MEETING

STATEMENT OF REVENUE AND EXPENDITURES

REVENUE

441 Exhibit booth rental \$19,200.00
442 Guest speaker sponsors 2,000.00
443 Wednesday evening social 4,500.00
444 President's banquet 4,000.00
445 Breakfast panel—1 800.00
446 Breakfast panel—2 800.00
447 Registration fees 32,000.00
449 Other - 0 -
Total Revenue \$63,300.00

EXPENDITURES

541 Exhibit booths \$ 3,000.00
542 Guest speakers 7,200.00
543 Wednesday evening social 7,000.00
544 President's banquet 8,000.00
545 Breakfast Panel—1 700.00
546 Breakfast Panel—2 700.00
547 Audio-visual equipment 3,000.00
548 Delegate's manual 3,000.00
549 Employee hotel 3,000.00
550 Gratuities 250.00
551 Miscellaneous 3,500.00
552 Newcomer Program 60.00
553 Nominating Committee 40.00
554 Postage 200.00
555 Printing 4,000.00
556 Promotion 4,000.00
557 Public Relations 2,500.00
558 Scientific Assembly
Committee 1,200.00
559 Supplies 1,500.00
560 Travel 400.00
561 Telephone 700.00
Total Expenditures \$53,950.00
Excess of Revenue
over Expense \$ 9,350.00

PUBLISHING DEPARTMENT STATEMENT OF REVENUE AND EXPENDITURES

REVENUE	
1 Advertising	\$22,000.00
2 Reprints	1,500.00
3 Subscriptions, member	50,840.00
4 Subscriptions, nonmember	1,000.00
5 Other	- 0 -
Total Revenue	\$75,340.00
EXPENDITURES	
4 Dues, subscriptions	\$ 150.00
5 Equipment maintenance	50.00
7 General overhead expense	4,400.00
8 Insurance, general	250.00
9 Insurance, health	280.00
1 Meeting	150.00
2 Miscellaneous	- 0 -
3 Payroll taxes	360.00
4 Postage	2,000.00
5 Printing	61,000.00
8 Salaries	6,000.00
9 Supplies	- 0 -
1 Travel	400.00
Total Expenditures	\$75,040.00
Excess of Revenue over Expense	\$ 300.00

BUILDING OPERATIONS STATEMENT OF REVENUE AND EXPENDITURES

REVENUE	
71-3 New Mbr. Bldg. Fund Assessments	\$30,000.00
74 Rental income (BOMEX)	13,950.00
75 Rental income (APP)	8,200.00
Total Revenue	\$52,150.00
EXPENDITURES	
71 Depreciation	\$12,000.00
72 Repair and maintenance	8,000.00
74 Building supplies	2,500.00
75 Interest	- 0 -
76 Property taxes	7,000.00
77 Utilities	18,000.00
78 Insurance	3,000.00
79 Bldg. overhead (recovery)	(2,400.00)
Total expenditures	\$48,100.00
Excess of Revenue over Expense	\$ 4,050.00

STATEMENT OF REVENUE AND EXPENDITURES

REVENUE	
81 Interest Income	\$2,000.00
EXPENDITURE	
504 Scholarships awarded	\$2,000.00
	- 0 -

OTHER BUSINESS

Treasurers Report

It was suggested that the Treasurer prepare a periodic narrative type report for publication in *Arizona Medicine*.

EXECUTIVE COMMITTEE

The meeting of the Executive Committee of the Arizona Medical Association, Inc., held at 810 W. Bethany Home Road, Phoenix, AZ on Friday, February 25, 1977 convened at 7:16 P.M., Edward Sattenspiel, M.D. president and chairman presiding.

DEPARTMENT OF HEALTH SERVICES

Dr. Dandoy reported that she will be meeting with the health officer of Senora Mexico to discuss mutual health matters including those who seek their care in this country and the problems attendant thereto. She also reported that there is considerable discussion in the legislature about developing alternative programs to Medicare as well as innovative rural health programs involving physician's assistants and nurse practitioners.

MALPRACTICE ASSESSMENT

Mr. Robinson reported that the following members have not paid the 1976 malpractice assessment as of February 25, 1977.

Cochise County
Edward H. Vogel, M.D.
Gila County
George E. Page, M.D.
Maricopa County
George L. Cannon, M.D.
James H. Coles, Jr., M.D.
Earl S. Cronk, M.D.
Robert L. Daywitt, M.D. (pd. \$50)
Richard E.H. Duisberg, M.D.
Hubbard F. Fellows, M.D.
George W. Gannon, M.D.
Charles W. Howard, M.D.
Dale B. Hylton, M.D.
Charles V. Kachel, M.D.
John E. McCarville, M.D.
Lyle B. McDowell, M.D.
Joseph M. Mitrick, M.D.
Kenneth J. Prebil, M.D.
Peter Sakkas, M.D.
Dale H. Stannard, M.D.
Thomas N. Thomas, M.D.
Maier I. Tuchler, M.D.
Abid Zaky, M.D.
Mohave County
Raymond E. Hammer, M.D.
Pima County
Ian M. Chesser, M.D.
Robert L. Crowdes, M.D.
Marc S. Feldman, M.D.
Morris H. Fine, M.D.
Andrew W. Gaudielle, M.D.
Gerald B. Goldstein, M.D.
Charles E. Harter, M.D.
Robert S. Hirsch, M.D.
Rashid A. Khan, M.D.
Paul W. Kohnen, M.D.
James Labelle, Jr., M.D.
Alberto R. Marquez, M.D.
George W. Nash, M.D.
Leland K. Reeck, M.D.
Jerome Rothbaum, M.D.
James G. Rothschild, M.D.
Marvin Weisbard, M.D.
Yavapai County
William T. Edmonds, M.D.
Yuma County

Robert Anderton, M.D.

Abe I. Podolsky, M.D.

BOARD OF DIRECTORS AGENDA

The committee reviewed the agenda for the Board of Directors meeting scheduled for February 26, 1977 and prepared various recommendations.

BOARD OF DIRECTORS

The meeting of the Board of Directors of the Arizona Medical Association, Inc., held at 810 W. Bethany Home Road, Phoenix, AZ on Saturday, February 26, 1977, a quorum being present, convened at 10:19 A.M., Edward Sattenspiel, M.D., president and chairman, presiding.

ARMPAC

Dr. Langston reported that Representative Diane B. McCarthy will be the guest speaker at the annual banquet scheduled for April 28, 1977, all are invited to attend. He also pointed out that 1978 is going to be a vital political year because redistricting will occur. ArMPAC will need to be strengthened for the activities of that year.

Dr. Sattenspiel noted that this will be Dr. Langston's last meeting as chairman of ArMPAC. The board expressed its appreciation to Dr. Langston with a round of applause. Confirmation of New Chairman

IT WAS MOVED AND CARRIED TO CONFIRM THE APPOINTMENT OF JAMES A. AUSTIN, M.D., AS THE NEW CHAIRMAN OF ARMPAC.

AMERICAN INDIAN SCHOOL OF MEDICINE

Jasper L. McPhail, M.D., Vice President and Dean of the American Indian School of Medicine reported to the board on the background and developments of the school as follows: (see *Arizona Medicine* April 1977)

ArMA AUXILIARY

Mrs. Hoffmann reported as follows:

"On behalf of the Auxiliary, I want to thank the Board of Directors for the additional support this year. You have offered us legal help and with the aid of Mr. Thomas Reilly, of Snell & Wilmer, we have completed legal requirements for incorporation and non-profit status. You have given us needed publicity by allowing us to submit auxiliary articles to Dr. John Kennedy for publication in *Arizona Medicine*. You have given us the opportunity to attend the ArMA Legislative Committee meetings and Mrs. John Clymer, our Legislation chairman, is grateful for this new opportunity as she feels it is of great value to the physician's spouse to receive this up-to-date information.

I would like to point out to the county medical society presidents that we are seeking new ways in our continuing efforts to organize additional county auxiliaries. There are only six organized counties at the present time: Coconino, Maricopa, Mohave, Pima, Yavapai and Yuma. Their membership ranges from 1300 in Maricopa County to 17 in Mohave County. If any medical society president would like to have an auxiliary for his medical society, please contact me. We will be most happy to work with you.

The Auxiliary seeks permission from this Board of Directors to offer our Hamer Education Loan Fund to Arizona medical students in Arizona medical schools. This fund was established through the generosity of Arizona auxiliary members by an annual assessment. The same rules and regulations would apply to medical students as to all other loan applicants. Loans of any amount up to but not exceeding \$500.00 per semester can be made to a student. The total amount borrowed by the student shall not exceed \$2,500.00 during his course of study. These loans are interest free and are to be repaid at the rate of \$50.00 or more monthly starting no later than two months after successful completion of the course of study.

Please let us know if you want the auxiliary to offer Hamer Education Loan funds to our medical students.

Thank you for this opportunity to report to you today."

IT WAS MOVED AND CARRIED TO APPROVE THE REQUEST TO OFFER THE HAMER EDUCATION LOAN FUND TO MEDICAL STUDENTS.

BOARD OF DIRECTORS

Southern District Director Resignation

Vernor F. Lovett, M.D. submitted his resignation effective April 30, 1977. It was accepted with regret, replacement to be part of the regular House of Delegates election process.

5th AMA National Leadership Conference

Dr. Kahle submitted the following report on the subject conference:

"This year's conference, entitled, 'Portrait: Dynamic Leadership for '77' was held in Chicago from January 20th to the 23rd. The AMA provides these meetings every January in order that individuals in medical leadership positions throughout the country have an opportunity to meet to review and discuss priority issues facing us all. This is probably one of the most important functions that the AMA provides. Programs such as, 'What's Ahead in '77,' 'Uncle Sam Has Plans for You,' 'Trends in State Legislation,' 'Toward National Health Insurance,' 'Assault on Professionalism' were covered fully and quite accurate resumes of them have been published in the recent *American Medical News*.

In the welcoming address, Dr. Palmer, the President of the AMA, issued a clarion call for unity among all the members of our profession. As he pointed out, we can't bury ourselves in our own little corner of the medical world and respond only to things affecting us as individuals. Instead, we have to come and work together under the only truly encompassing organization that we have—the AMA. Dr. James Sammons, Executive Vice-President of the AMA, summed up by saying that the AMA will fight for our liberty as professionals and that *all* doctors need the AMA to fight against the onslaught of the many anti-professional thrusts. He provided a very interesting statistic that \$70 of each of our \$250 per yearly dues for AMA goes toward support of AMA activities that are for the benefit of

patients and non-AMA members of our profession. In other words, freeloaders are costing each of us \$70 per year.

There is a good consensus that President Carter will act slowly on the national health insurance issue; but, he is definitely dedicated to this idea. The major problem, of course, is financing and money. President Carter's main difficulty is going to arise from his blatant promise to balance the budget by 1980. This is the one thing that probably will save us from a national health scheme. The legislative approach will be piecemeal with Planning Act amendments, Medicaid fraud curbs, catastrophic health insurance, and activity directed toward the mal-distribution of medical skills.

Senator Eagleton of Missouri stated that he did not feel that national health insurance was necessarily inevitable because the cost factor is actually the key issue. He made a strong point that Social Security funding is probably not the way to go because projections of that system tells us that between the years 1990 and 2000 the government will be paying out more in pensions than the combined payroll of the entire working group of taxpayers. Senator Talmadge discussed his Medicaid fraud legislation and left a chill over the entire audience with his comments that it was time we all worked together and quit using such cliches as, 'patient-doctor relationship.'

There were 720 people in attendance at this conference and only four from Arizona; Dan Cloud, Bruce Robinson, Diane McCarthy, and myself. Diane was there as a member of the panel on 'Trends in State Legislation' and was the star of the program for which we can all be justly proud. On the other hand, the sparse representation from Arizona was nothing of which to be proud. These programs are for medical leaders at all levels, not just the state. For instance, Bergen County (New Jersey) had 14 or 15 people at the meetings. Next year, there should be more of our state officers, as well as officers from all the counties that can afford to send them. This is the type of program in which there cannot be too much participation! Hopefully, you people that read this report will bring this message back to your component societies and start making budgetary plans for the January, 1978 AMA National Leadership Conference."

1977 Physician Award for Community Service

After an official vote it was determined that Grace L. Busch, M.D. of Chandler, be chosen as the recipient of the 1977 Physician Award for Community Service.

BoMEX Appointments

It was pointed out that there are three vacancies on the Board of Medical Examiners. We have submitted five names since last October, but the Governor has taken no action.

IT WAS MOVED AND CARRIED TO RESUBMIT THE SAME FIVE NAMES AS FOLLOWS:

E. CHARLES BILL, M.D.
ALBERT ECKSTEIN, M.D.
EDMUNDO F. FELIX, M.D.

MEYER MARKOWITZ, M.D.
GILBERT L. SECHRIST, M.D.

EXECUTIVE COMMITTEE

Membership Classification

Changes Approved

Cochise County Medical Society

(a) John C. Conroy, M.D.—Active to Associate, Account Retirement—Dues Exempt Effective 1/1/78

(b) Edith Brown, M.D.—Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

Maricopa County Medical Society

(a) L.D. Beck, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(b) Robert J. Bryan, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(c) Roy E. Burgess, M.D.—Active to Active Over 70—Account Age—Dues Exempt Effective 1/1/77

(d) R. Lee Foster, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(e) Warren Gorman, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(f) Carlos V. Greth, M.D.—Active to Associate—Account Illness—Dues Exempt—Effective 1/1/77

(g) Artell Johnson, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(h) Paul A. Johnson, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(i) Margaret L. Kerr, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(j) Noah M. Koenigsberg, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(k) Paul B. Patton, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(l) Philip Rice, M.D.—Active to Associate—Account Retirement—Dues Exempt—Effective 1/1/77

(m) Alvin Swenson, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(n) Audrey G. Urry, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(o) J.A. Van Ham, M.D.—Active to Associate—Account Retirement—Dues Exempt Effective 1/1/77

(p) Lowell C. Wormley, M.D.—Active to Active Over 70—Account Age—Dues Exempt—Effective 1/1/77

(q) George S. Atkinson, M.D.—Active to Associate—Account Illness—Dues Exempt—Effective 1/1/77

Pima County Medical Society

(a) Dennis Bernstein, M.D.—Active to Associate—Account Retirement—Dues Exempt—Effective 1/1/77

(b) James F. Blute, Jr., M.D.—Active to Affiliate—Account Moving out of State—Dues

empt—Effective 1/1/77
 Abraham M. Cutler, M.D.—Active to Af-
 ate—Account Moving out of State—Dues
 empt—Effective 1/1/77
 Donald B. Lewis, M.D.—Active to Asso-
 te—Account Retirement—Dues Exempt—
 effective 1/1/77
 Robert E. McDonald, M.D.—Associate to
 liate—No longer licensed—Dues Exempt
 Effective 1/1/77
 Charles A. Tompkins, M.D.—Active to As-
 iate—Account Retirement—Dues Exempt
 Effective 1/1/77
 al County Medical Society
 F.H. Buckmaster, M.D.—Active to Asso-
 te—Account Retirement—Dues Exempt—
 effective 1/1/77
 Wilfred W. Forbes, M.D.—Active to As-
 iate—Account Retirement—Dues Exempt
 Effective 1/1/77
 Milton I. Robinson, M.D.—Active to Ac-
 e Over 70—Account Age—Dues Exempt—
 effective 1/1/77
 conino County Medical Society
 M.G. Fronske, M.D.—Active to Associate
 Account Retirement—Dues Exempt—Ef-
 fective 1/1/77
 ma County Medical Society
 Robert A. Stratton, M.D.—Active to As-
 iate—Account Retirement—Dues Exempt
 Effective 1/1/77
 77 Dues Exemptions Granted

IT WAS MOVED AND CARRIED TO
 RANT THE FOLLOWING EXEMPTIONS
 OR 1977 DUES AS REQUESTED BY THE
 PROPRIATE COUNTY MEDICAL SO-
 ETY.

Robert S. Keller, M.D.—Pinal
 C. James Statt, M.D.—Maricopa
 Martin S. Withers, M.D.—Pima
 John C. Flannery, M.D.—Maricopa
 Carey C. Womble, M.D.—Pima
 Sidney R. Kemberling, M.D.—Pima

ARTICLES OF INCORPORATION AND BYLAWS COMMITTEE

The House of Delegates, during their 1976
 meeting, directed that clarification be made of
 no could introduce resolutions. The com-
 mittee recommended that the following para-
 graphs be added to Chapter VIII, Section b(e).
 Resolutions may be proposed by (A) the
 board, (B) any Delegate, (C) any county so-
 ciety, (D) any committee of the Association,
 (E) by petition signed by twenty or more
 members of the Association.

At the discretion of the Speaker, more than
 e committee on resolutions may be ap-
 pointed in accordance with Chapter VIII.
 ction 6. Reference Committees.

IT WAS MOVED AND CARRIED TO IN-
 RODUCE THE APPROPRIATE RESOLU-
 ON INCLUDING THE ABOVE WORDING
 WITH THE SENTENCE "ALL RESOLU-
 IONS ARE TO BE ACCOMPANIED BY A
 SCAL NOTE WHERE APPROPRIATE"
 O BE ADDED AT THE END OF THE
 FIRST PARAGRAPH.

FINANCE COMMITTEE

1976 Audit

Dr. Clymer reviewed, in detail, the audit
 report for the year ending 12/31/76 as pre-
 pared by Henry & Horne, Certified Public
 Accountants.

1978 Budget

Following an extensive review of the pro-
 posed budget for 1978 by the Treasurer, Dr.
 Clymer.

IT WAS MOVED AND CARRIED TO SUB-
 MIT THE FOLLOWING RESOLUTION TO
 THE HOUSE OF DELEGATES

1978 CALENDAR YEAR BUDGET OF INCOME AND EXPENSE

WHEREAS, It is customary for the House
 of Delegates to approve the Budget of Income
 and Expenditures for the next succeeding
 calendar year of the Arizona Medical Asso-
 ciation, Inc.; therefore be it
 RESOLVED, That the following Budget of
 Income and Expenditures for the calendar
 year 1978 be adopted:

	INCOME	EXPENDITURES	
General Dept.	\$706,450.00	\$543,640.00	\$162,810.00
Committee Dept.	82,265 00	98,000 00	(15,735.00)
Annual Meeting Dept.	63,300.00	53,950.00	9,350.00
Publishing Dept.	75,340.00	75,040.00	300.00
TOTAL	\$927,355 00	\$770,630.00	\$156,725.00

; and be it further

RESOLVED, That the annual dues of the
 Arizona Medical Association, Inc. be \$250 for
 Active members, with \$230 going to General
 Department Budget and \$20 going to the
 Publishing Department Budget; and be it
 further

RESOLVED, That the Service member dues
 be \$62.50 with \$42.50 going to the General
 Department Budget and \$20 going to the
 Publishing Department Budget; and be it
 further

RESOLVED, That the Intern or Resident
 Active member dues be \$25, with \$5 going to
 the General Department Budget and \$20
 going to the Publishing Department Budget.

PHYSICIAN REHABILITATION COMMITTEE

Confirmation of Appointment

IT WAS MOVED AND CARRIED TO
 CONFIRM THE APPOINTMENT OF
 WILLIAM N. BAUER, M.D. TO THE
 COMMITTEE.

PROFESSIONAL COMMITTEE

Confirmation of Appointment

IT WAS MOVED AND CARRIED TO
 CONFIRM THE APPOINTMENT OF
 FRANK PENA, M.D. TO THE COMMIT-
 TEE.

Urine Therapy

IT WAS MOVED AND CARRIED THAT
 URINE THERAPY, IN THE TREATMENT
 OF ALLERGIC DISEASES, HAS NOT BEEN
 ESTABLISHED AS EFFECTIVE, NOR HAS
 ITS SAFETY BEEN ESTABLISHED IN THE
 USUAL AND CUSTOMARY MANNER,

AND FURTHER THAT THIS STATEMENT
 BE PROVIDED TO THE BOARD OF MEDI-
 CAL EXAMINERS.

Podiatry and Hospital Privileges

IT WAS MOVED AND CARRIED THAT
 THE ARIZONA MEDICAL ASSOCIATION
 APPROVE THE JOINT STATEMENT BY
 REPRESENTATIVES OF THE ARIZONA
 PODIATRY ASSOCIATION, CENTRAL
 ARIZONA ORTHOPEDIC SOCIETY, AND
 THE ARIZONA HOSPITAL ASSOCIATION
 OF NOVEMBER 29, 1976, AND THE SUG-
 GESTED BYLAW AMENDMENTS AS AN
 ADDENDUM THERETO.

JOINT STATEMENT

It is the opinion of this combined group
 that the potential solution to the problem
 that exists between Podiatry and medicine
 may best be implemented by encouraging
 joint medical staff and hospital administra-
 tion participation in promulgating bylaw
 changes which will permit Podiatrists to ap-
 ply to medical staffs. As an addendum to this
 opinion, it is recommended that the suggested
 medical staff bylaw changes, as proposed by
 the Arizona Hospital Association, be used as
 a guideline.

SUGGESTED MEDICAL STAFF BYLAWS Affiliate Staff

The affiliate staff shall be composed of para-
 medical, dental and parodontal practitioners
 and scientists in medical, paramedical and
 parodontal fields who are not eligible for
 membership on the Medical Staff and whose
 training and abilities are beneficial to pa-
 tient care.

Before an application can be accepted for
 Affiliate Staff membership, the category or
 classification into which an applicant would
 fit must be approved by the Executive Com-
 mittee of the Medical Staff, the Active Medi-
 cal Staff and the Board of Directors of the
 hospital. Applicants who fit into an approved
 category or classification shall submit ap-
 plications to the administrator who will for-
 ward them to the Executive Committee of the
 Medical Staff for processing. Executive Com-
 mittee decisions concerning granting or denial
 of Affiliate Staff status to applicants shall be
 final; subject only to approval by the hospital
 governing board. Procedural rules and privi-
 leges applicable to members of the Medical
 Staff shall not apply to the Affiliate Staff.

Affiliate Staff members shall not have privi-
 leges to admit patients at the hospital but
 shall be permitted to attend patients who are
 under the care and supervision of physicians
 on the Medical Staff.

Members of the Affiliate Staff may be as-
 signed, either individually or through Affili-
 ate Staff sections to specific departments of
 the hospitals.

Affiliate Staff appointments shall be re-
 viewed every two years and reappointments
 shall be made at the discretion of the Execu-
 tive Committee which shall consider the best
 interest of the hospitals and its patients.

Members of the Affiliate Staff may be re-
 quired to pay dues as determined by the Ex-
 ecutive Committee and may assist the Execu-

tive Committee at its request, in any matters concerning the Affiliate Staff.

The list of categories of Affiliate Staff members approved by the Executive Committee of the Medical Staff, the Active Medical Staff and the Board of Directors, shall be kept current and attached as an addendum to these bylaws.

Amendment of that list shall not be subject to the provision of Article _____ on amendment of the Medical Staff bylaws but shall only require the approval of the Executive Committee, the Active Medical Staff, and the Board of Directors with such approval being shown in any customary form.

Forms for the application of Affiliate Staff membership shall contain the information required for each category.

Podiatrist Category

Podiatrists who are licensed by the State of Arizona may be granted privileges based on documented training, experience and current competence. Members of this category may, at the request of the Executive Committee, assist in developing application documentation in determining membership and in granting of clinical privileges.

Podiatric procedures shall be under the supervision of the Department of Surgery.

Podiatrists may initiate admitting procedures on the concurrence of a member of the Active Medical Staff, who shall have overall responsibility for the patient's care.

Patients admitted for podiatric care shall receive an admission history and physical performed by a member of the Active Medical Staff as required by these bylaws, rules and regulations. Orders for podiatric care and medications as provided for by licensure shall be initiated by members of the podiatry staff.

Ancillary Health Care Occupations

Discussion ensued on the recommendation of the committee regarding licensure, certification or registration of Ancillary Health Care Occupation.

IT WAS MOVED AND CARRIED TO TABLE THIS MATTER.

BoMEX Reporting Requirements

The board reviewed the recommendation of the committee which read as follows:

"It was moved and carried to inform the Board of Directors that the Professional committee has reviewed the proposed regulations provided to the Board of Medical Examiners on 'Reporting pursuant to A.R.S. 32-1451.' It is strongly recommended that the Board of Directors inform the Board of Medical Examiners that paragraph RI-3-3 entitled, suspensions for incomplete medical records, on page C3, be deleted. Further it is recommended that only hospital administration proceedings resulting in the revocation, permanent suspension or permanent limitation of clinical privileges be reported and further that prior to adoption of rules and regulations it is anticipated that the Association will have opportunity to review the Board of Medical Examiners proposal."

IT WAS MOVED AND CARRIED TO APPROVE THE RECOMMENDATION OF THE

COMMITTEE.

Extended Role of the Nurse

The board discussed at length the committee's recommendation, "That the moratorium in certifying the various extended roles of nursing be removed. It is the opinion of this Association, that it is proper for the Nursing Board to collaborate with the Joint Board of Medical and Osteopathy Examiners in the certification of nurses in the extended role."

A motion to approve the committee's recommendation was defeated.

Specialty Listing - BOMEX Directory

IT WAS MOVED AND CARRIED TO INTRODUCE THE FOLLOWING RESOLUTION TO THE HOUSE OF DELEGATES NEXT MEETING.

SPECIALTY LISTING - BOMEX ANNUAL MEDICAL DIRECTORY

WHEREAS, REQUESTS HAVE BEEN MADE BY PHYSICIANS THAT THE ANNUAL MEDICAL DIRECTORY PUBLISHED BY THE ARIZONA BOARD OF MEDICAL EXAMINERS INDICATE WHETHER THE INDIVIDUAL PHYSICIAN IS BOARD CERTIFIED IN THE SPECIALTY; AND

WHEREAS, THE BOARD OF MEDICAL EXAMINERS REQUEST CONSIDERATION OF THIS MATTER BY THE ARIZONA MEDICAL ASSOCIATION: THEREFORE BE IT

RESOLVED, THAT THE ARIZONA MEDICAL ASSOCIATION RECOMMENDS THAT THE ANNUAL ARIZONA STATE MEDICAL DIRECTORY PUBLISHED BY THE ARIZONA BOARD OF MEDICAL EXAMINERS INCLUDE, ALONG WITH ALL CURRENT DATA PROVIDED, WHETHER THE INDIVIDUAL PHYSICIAN LISTED IS CERTIFIED BY THEIR SPECIALTY BOARD.

LEGISLATIVE COMMITTEE

Mr. Barnett reviewed the actions of the Legislative Committee's last two meetings which included Medicaid Repeal, Confidentiality of Peer Review Committees, Physician's Assistants, Reregistration fee for BOMEX, Optometry and H.B. 2097, Coordination of Benefits between insurance companies. H.B. 2097

Considerable discussion ensued on the Legislative Committee's support of H.B. 2097.

IT WAS MOVED AND CARRIED TO REVERSE THE LEGISLATIVE COMMITTEE'S POSITION ON H.B. 2097 AND TO CHANGE THE ASSOCIATION'S POSITION TO THAT OF NON-SUPPORT OF H.B. 2097.

IT WAS MOVED AND CARRIED TO ADOPT THE REPORT OF THE LEGISLATIVE COMMITTEE AS AMENDED IN REGARD TO H.B. 2097.

CORRESPONDENCE

Hugh C. Thompson, M.D., letter 12/28/76 - Auto Restraint Devices

IT WAS MOVED AND CARRIED TO ENDORSE THE PROPOSED PROGRAM TO FURTHER THE USE OF PROPER AUTO RESTRAINT DEVICES FOR INFANTS AND SMALL CHILDREN AS OUTLINED IN DR. THOMPSON'S LETTER OF 12/28/76.

AMA LETTER 11/24/76 - Medical Association Management program at Northwestern University graduate School of Management

The request for scholarship funds to support the subject program was reviewed.

IT WAS MOVED AND CARRIED TO INDICATE SUPPORT OF THE SUBJECT PROGRAM BY FORWARDING A CHECK \$100.00 AND THEN REFERRING THE MATTER TO THE FINANCE COMMITTEE FOR THEIR CONSIDERATION OF A POSSIBLE FULL SCHOLARSHIP AT A LATER DATE.

Pima County Medical Society letter 2/24/77 - Annual Meeting Registration fees for Delegates

Pima County Medical Society request "that members who are attending the business meetings to represent their county should be exempt from the cost of registration."

IT WAS MOVED AND CARRIED TO REFER THIS MATTER TO THE SCIENTIFIC ASSEMBLY COMMITTEE FOR CONSIDERATION AND RECOMMENDATIONS.

OTHER BUSINESS

Certificate of Membership

Dr. Kahle reviewed the concept of providing a certificate of membership in lieu of the annual membership. RECEIVED FOR INFORMATION.

Greater Southern Arizona PSRO

IT WAS MOVED AND CARRIED TO ISSUE A LETTER OF ENDORSEMENT TO THE GREATER SOUTHERN ARIZONA PSRO AS REQUESTED.

Blue Shield

The actions of the Blue Shield Board Directors as set forth in the president's letter that organization letter of February 11, 1977 were discussed in great detail.

IT WAS MOVED AND CARRIED TO REFER THIS MATTER TO THE MEDICAL ECONOMICS COMMITTEE FOR STUDY AND CONSULTATION WITH LEGAL COUNSEL WITH THE REQUEST THAT THE COMMITTEE HAVE ITS RECOMMENDATION READY FOR THE NEXT BOARD OF DIRECTORS' MEETING.

MEDICAL EDUCATION COMMITTEE

Meeting of the Medical Education Committee of the Arizona Medical Association, held Thursday, March 3, 1977, at 810 West Broadway Home Road, Phoenix, convened at 7:00 P.M., Robert E.T. Stark, M.D., Chairman presiding.

PROPOSED CME STUDY

Hugh C. Thompson, M.D., presented information to the Committee regarding a proposed study of CME habits of Arizona physicians. It was explained that the proposal still being refined and that funding must be sought, hopefully from a private foundation. One of the purposes of the study is to gather information which would be useful in evaluating CME as it now exists and as it might be improved. Dr. Thompson seeks the endorsement of the Arizona Medical Association, which he feels is of prime importance

ceeding with development and ultimate ending of the study.

IT WAS MOVED AND CARRIED TO RECOMMEND TO THE ArMA BOARD OF DIRECTORS THAT THE PROPOSED CONTINUING MEDICAL EDUCATION STUDY OF HUGH C. THOMPSON, M.D., BE ENDORSED BY ArMA UPON PRESENTATION BY DR. THOMPSON OF THE FINALIZED PROPOSAL.

SECTION REPORTS

Section on Accreditation

William F. Sheeley, M.D., Chairman, reported that a resurvey of Tucson Hospitals Medical Education Program has been conducted, and the Section has approved the recommendations of the survey team. The committee approved and took the following action:

IT WAS MOVED AND CARRIED TO RECOMMEND TO AMA THAT THE CME PROGRAM OF TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM BE REACCREDITED FOR A FOUR-YEAR PERIOD, WITH RESURVEY AT THAT TIME.

Dr. Sheeley reported that the Section discussed the possibility of accreditation of the Arizona Medical Association through its Scientific Assembly Committee—for information.

The Section considered an application for accreditation of an annual cardiovascular congress submitted by the Arizona Heart Institute. Dr. Sheeley reported that the Section has approved the presurvey questionnaire. A survey team will be selected and a survey conducted during the March 27-30 program of the Heart Institute.

Section on Certification

Ashton B. Taylor, M.D., Chairman, reported that the Board of Directors has approved the change of reporting period to the calendar year. He requested that the Committee give consideration to establishing the deadline for reporting CME as February 15 rather than April 1 as originally decided.

IT WAS MOVED AND CARRIED THAT THE DEADLINE FOR REPORTING CONTINUING MEDICAL EDUCATION ACTIVITIES BE ESTABLISHED AS FEBRUARY 15 OF THE YEAR FOLLOWING DUE DATE.

Dr. Taylor reported on several CME delinquent physicians and made recommendations to the Committee. One of these was a physician who had been dropped due to non-compliance of his 1975 requirement but now wishes to be reinstated by meeting the requirement by 1976. This was approved.

There were three physicians delinquent for 1976, two of whom are to be referred directly to the Grievance Committee, the third to be referred if he does not comply within 30 days.

IT WAS MOVED AND CARRIED TO ACCEPT THE RECOMMENDATIONS OF THE SECTION ON CERTIFICATION, AS AMENDED, REGARDING CME DELINQUENTS REPORTED TO THE COMMITTEE.

Section on Graduate Medical Education

Jack M. Layton, M.D., Chairman, reported briefly on the Health Manpower Bill, problems between the Liaison Committee on Graduate Medical Education (LCGME) and residency re-review committees, LCGME bylaws approval and other matters of concern to his section. The Section has not met but he anticipates more activity as the LCGME becomes active.

Section on Requirements

Albert G. Wagner, M.D., Chairman, reported on the volume of program approval requests received. Most are being handled by referral to Dr. Wagner, but occasionally the entire Section is consulted when there is some doubt regarding a program's qualifications.

Dr. Wagner asked for the Committee's input regarding proposed revisions in the CME guidelines. Basically, they are being brought into closer conformance to the guidelines for the Physician's Recognition Award.

IT WAS MOVED AND CARRIED TO APPROVE THE 1977 GUIDELINES AS SUBMITTED, WITH ANY ADDITIONAL SUGGESTIONS FROM COMMITTEE MEMBERS TO BE INCORPORATED AT THE DISCRETION OF THE SECTION ON REQUIREMENTS.

CONFERENCE OF STATE CME CHAIRMEN

Dr. Stark reported on an exchange of letters with Melvin D. Small, M.D., of the Medical Society of Virginia concerning formation of a conference of state CME committees or commissions for purposes of exchange of ideas and to seek direct representation on the Liaison Committee for Continuing Medical Education. This proposal had surfaced during the October, 1976 CME meeting in Chicago and has been approved in principle by the President of AMA.

IT WAS MOVED AND CARRIED TO RECOMMEND PARTICIPATION IN AN EFFORT TO ESTABLISH DIRECT FORMAL REPRESENTATION OF STATE CME CHAIRMEN ON THE LIAISON COMMITTEE FOR CONTINUING MEDICAL EDUCATION THROUGH A CONFERENCE ON STATE CONTINUING MEDICAL EDUCATION CHAIRMEN.

SUBCOMMITTEE ON MEDICAL AUDIT

Robert E. Hastings, M.D., Chairman, reported that there has been no activity to date but that he expects to attend a conference on the subject and will report back to the Committee after that conference takes place.

LEGISLATIVE COMMITTEE

Meeting of the Legislative Committee of the Arizona Medical Association, held Saturday, March 5, 1977 at 810 West Bethany Home Road, Phoenix, Arizona convened at 1:22 P.M., Selma E. Targovnik, M.D., Chairperson, presiding.

CONSIDERATION OF LEGISLATION HB 2114—CREDENTIALING OF ALLIED HEALTH PROFESSIONS

Dr. Flynn explained legislation introduced which would provide for the credentialing of allied health professions under the Depart-

ment of Health Services, such as Radiologic Technologists, Laboratory Techs., Audiologists, etc. This legislation would not affect the existing state licensing boards.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO HB 2114, CREDENTIALING—ALLIED HEALTH PROFESSIONS.

SB 1265—PRONOUNCEMENT OF DEATH

Senate Bill 1265 would provide for conditions necessary for the pronouncement of death by a physician stating that if it is determined that a person has total and irreversible cessation of brain function, based on standards of medical practice, a physician shall pronounce the person dead and prescribe the time. It also would provide that a physician can use other usual and customary procedures for determining death. The committee considered the AMA position that "statutory definition of death is neither desirable or necessary."

IT WAS MOVED AND CARRIED TO OFFER NON-SUPPORT OF SENATE BILL 1265.

HB 2321—PROVISION OF HEALTH CARE SERVICES— STATE MATCHING FUNDS

Dr. Flynn explained legislation co-sponsored by he and Mrs. McCarthy. Memorandum to the members of the House of Representatives was distributed as an explanation as follows:

The bill will offer a new concept in health delivery and is not truly an alternative to Medicaid.

Medicaid is merely a funding mechanism for transfer of dollars from a combination of funds to the providers of care.

This new program—named AHEAD—Arizona Health Education and Delivery—will go beyond mere funding and include components of actual delivery of care.

It would authorize, among other things, counties to provide certain additional health care services such as early and periodic health screening of persons under six years of age and provide state matching funds to counties providing such services.

This bill would become effective conditioned on the repeal of the Medicaid program in Arizona.

Hospitalization and Medical Care for Indigents

Under existing law, counties have the sole responsibility to provide for the hospitalization and medical care for the indigent sick in the county. This bill would define hospitalization and medical care as including:

- (1) Inpatient hospital services.
- (2) Outpatient services provided by a licensed health care institution.
- (3) Other laboratory and X-ray services.
- (4) Skilled nursing services for persons twenty-one years of age or older.
- (5) The services of a medical doctor or doctor of osteopathy or other licensed health care provider approved by the county.
- (6) Prescribed drugs when ordered by a medical doctor or doctor of osteopathy or other

licensed health care provider approved by the county.

Counties would be mandated under this bill to provide hospitalization and medical care which meets minimal standards. Additional Health Care Services

In addition to the services which counties would provide as hospitalization and medical care for the indigent sick, this bill would authorize counties to provide the following additional health care services to the indigent sick on an optional basis:

- (1) Early and periodic health screening, diagnosis and treatment of persons under six years of age, including the provision of hearing aids.
- (2) Transportation to and from medical services within and without the county.
- (3) Dental services, other than cosmetic.
- (4) Eye care services.
- (5) Other health care services for which minimal state standards have been prescribed.

Any county providing such additional health care services would be required to meet minimal standards and would be eligible for state matching funds of a ____ percent state/____ percent matching basis.

This bill would also permit a county board of supervisors to provide such additional health care services to persons other than indigents. Such persons would be required to reimburse the board of supervisors for at least a portion of the costs of provided services based on a system of cost-sharing.

Tax Levy

This bill would authorize the board of supervisors to include in its annual budget and tax levy for county purposes, such amount as it deems necessary and appropriate to provide any or all of the additional health care services noted above.

Ambulance Services

in Other Than Emergency Cases

This bill would specify that air ambulance services of the emergency medical services division of the Department of Public Safety provided at the request of any licensed physician be without any charge to the patient. Under existing law and regulations, such transportation services are provided only in emergency cases. This provision would, for example, enable counties to transport patients with long-term, but not emergency health care problems from one hospital to another within the state which can offer more appropriate treatment, i.e. cobalt treatment, CAT scanning, kidney dialysis, etc.

Health Education is Another Component of This Program

It is necessary to teach people those things they can do for themselves—so that the delivery system is not overutilized. This is not a new concept; it has been done by the University of Arizona Extension Service through the Department of Agriculture.

Intercounty Agreements

This component will allow the provision of care at the nearest place, i.e. Ash Fork is close to Williams but not in the same county. This system for administration is already in

place in the MMIS system developed through the Department of Health Services.

Appropriation

The sum of \$11 million would be appropriated to the Department of Health Services for the purpose of matching county funds expended for additional health care services to indigents and other eligible persons.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE SUPPORT TO HOUSE BILL 2321 PROVIDING FOR AN ALTERNATIVE TO MEDICAID.

SB 1192—INFORMED CONSENT—ABORTION

Senate Bill 1192 provides for a written informed consent prior to abortion which includes the facts of fetal development as of the time the proposed abortion, and that no abortion may be performed within 24 hours after giving the consent, and includes a penalty of a misdemeanor. It was noted that informed consent is now part of a common law.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1192 REQUIRING INFORMED CONSENT PRIOR TO ABORTION.

HB 2183—PARENTAL AND SPOUSAL CONSULTATION—ABORTION

House Bill 2183 would provide for parental consultation of an unmarried minor woman with a written statement signed by the parents prior to abortion. It would also require the married woman to consult with her spouse prior to an abortion and provide for a penalty of misdemeanor.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO HOUSE BILL 2183.

HB 2334—PROHIBITING USE OF PUBLIC MONIES FOR ABORTION

House Bill 2334 would prohibit the expenditure of any state or political sub-division monies to perform abortion, except to save the life of a mother.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO HOUSE BILL 2334.

SB 1240; HB 2318—DEFINING PERSONS TO INCLUDE UNBORN CHILD

Senate Bill 1240 and House Bill 2318 provide for a definition of person to include unborn child.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO HOUSE BILL 2318 AND SENATE BILL 1240.

SB 1239; HB 2317—UNBORN CHILD: SUBJECT OF WRONGFUL DEATH ACTION

Senate Bill 1239 and House Bill 2317 provide that the subject of wrongful action shall include an unborn child and prescribe who may maintain action for the death of a child.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1239 AND HOUSE BILL 2317.

HB 2258—FETAL DEATH CERTIFICATE DUE TO ABORTION

House Bill 2258 provides for registration

of fetal death certificate due to an abortion and prescribes penalty of misdemeanor for those who violate this code.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO HOUSE BILL 2258.

H.C.R. 2003—RIGHT TO LIFE

House Concurrent Resolution 2003 urges congress to call a constitutional convention to propose an amendment to the constitution of the United States to protect the right of life of all human beings from the moment fertilization.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO HOUSE CONCURRENT RESOLUTION 2003.

SB 1228—LOANS TO MEDICAL STUDENTS

Senate Bill 1228 provides for medical student loans through a board established under the bill prescribing the conditions for repayment or service in a medically underserved area in lieu of repayment. Considerable discussion ensued.

IT WAS MOVED AND CARRIED TO TABLE CONSIDERATION OF SENATE BILL 1228 PROVIDING FOR MEDICAL STUDENT LOANS.

SB 1205; HB 2357—GENERIC DRUGS—SUBSTITUTION

Senate Bill 1205 and House Bill 2357 would provide for substitution of generic drug for prescribed brand named drug when it is biochemically, chemically, and clinically equivalent to the brand name drug and has the bioavailability, and when the generic drug costs less than the brand name drug.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1205 AND HOUSE BILL 2357.

SB 1156—BOARD OF NURSING


Senate Bill 1156 provides for the removal of current requirement that the governor make an appointment to fill a vacancy on the Board of Nursing from a list submitted by the Arizona State Nurses' Association. It was stated that the Arizona State Nurses' Association and the Board of Nursing may provide an amendment to Senate Bill 1156 which would remove language inserted in 1974 that the rules and regulations developed by the Board of Nursing as pertains to the Nurse Practitioners would be authorized in collaboration with the joint Board of Medical Examiners and Osteopathy Examiners as discussed during meeting held January 8, 1977.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1156 AND PROPOSED AMENDMENT PROVIDING FOR A CHANGE IN THE DEFINITION OF PROFESSIONAL NURSING—NURSE PRACTITIONERS.

SB 1371—STATE BOARD OF NURSING—FEES

Senate Bill 1371 would amend the nurse practice act increasing the fee charges for licensure.

IT WAS MOVED AND CARRIED TO OFFER NO ACTION TO SENATE BILL 1371.



Natural balance doesn't always come naturally

Big Balanced Rock, Chiricahua Mountains, Arizona (approx. 1,000 tons)

- **Most Widely Prescribed**—Antivert is the most widely prescribed agent for the management of vertigo* associated with diseases affecting the vestibular system such as Menière's disease, labyrinthitis, and vestibular neuronitis.
- **Relief of Nausea and Vomiting**—Antivert/25 can relieve the nausea and vomiting often associated with vertigo.*
- **Dosage for Vertigo***—The usual adult dosage for Antivert/25 is one tablet t.i.d.

BRIEF SUMMARY OF PRESCRIBING INFORMATION

*INDICATIONS. Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children. Clinical studies establishing safety and effectiveness in children have not been done, therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy. See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

More detailed professional information available on request.

ROERIG 
A division of Pfizer Pharmaceuticals
New York, New York 10017

Antivert[®]/25 
(meclizine HCl) 25 mg. Tablets
for vertigo*

DYAZIDE

® Each capsule contains 50 mg. of Dyrenium® (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

Trademark

MAKES SENSE FOR LONG-TERM CONTROL OF HYPERTENSION*



**LOWERS
BLOOD
PRESSURE**

**CONSERVES
POTASSIUM**

Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* WARNING

This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* Indications: When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes (see Warnings).

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyper-

kalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K⁺ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K⁺ intake. Associated widened QRS complex or arrhythmia requires prompt additional therapy. Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K⁺ frequently; both can cause K⁺ retention and elevated serum K⁺. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia,

thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

SK&F CO., Carolina, P.R. 00630
Subsidiary of SmithKline Corporation

TRIAMTERENE CONSERVES POTASSIUM WHILE HYDROCHLOROTHIAZIDE LOWERS BLOOD PRESSURE

SB 1199; SB 1302—SUNSET LAWS

Senate Bill 1199 and Senate Bill 1302 provide for a legislative review of certain regulatory agencies, commissions, and Boards such as the Arizona State Board of Medical Examiners. The legislation further provides that a board would be terminated after review and determined that the merits of the activities of such board did not support its continued existence. Mr. Boykin of the State Board of Medical Examiners informed the committee that the bills would create an additional work load upon the agencies. In that not all agencies are required to submit annual reports to the governor, it appears that these instruments would provide sufficient data to determine the activities of each.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1199 AND SENATE BILL 1302.
SB 2281; SB 1351—CYSTIC FIBROSIS

House Bill 2281 and Senate Bill 1351 would provide that the Department of Health Services shall develop and conduct a program of care and treatment for adults with cystic fibrosis and provide for an appropriation of \$5,000. It was pointed out that House Bill 2281 has been considered by the House Health Committee and held as special interest legislation for one disease entity.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON HOUSE BILL 2281 AND SENATE BILL 1351.

SB 1278—MICROWAVE OVEN—POSTING OF NOTICE

Senate Bill 1278 provides that the owner/manager of a restaurant using microwave ovens post a notice that such facility uses a microwave oven in the preparation of food and that such use may be hazardous to health of any person who has a pacemaker or similar implanted device.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO SENATE BILL 1278.

SB 1168—BLOOD DONATION BY MINORS

Senate Bill 1168 would provide that a minor who has reached the age of 17 years, may donate blood without monetary compensation. IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO SENATE BILL 1168.

SB 2241—WORKMEN'S COMPENSATION CHOICE OF PHYSICIAN

House Bill 2241 provides that an employee may receive treatment from a physician of his choice and further prescribing procedures for the employer to object to the employee's physician. It was pointed out that the occupational health committee of the association has considered such legislation in previous years and opposed it on the basis of costs to workmen's compensation.

IT WAS MOVED AND CARRIED TO OFFER NON-SUPPORT TO HOUSE BILL 2241.

SB 2186—REPEAL OF VEHICULAR EMISSIONS INSPECTION

House Bill 2186 would provide for the re-

peal of motor vehicular emission inspection program in Maricopa and Pima County.

IT WAS MOVED AND CARRIED TO OFFER NON-SUPPORT TO HOUSE BILL 2186.

HB 2215—NOISE POLLUTION REGULATIONS

House Bill 2215 would provide authority for the adoption of rules and regulations by the Department of Health Services concerning noise pollution and control of excessive noise emissions which are deemed to be injurious to the health of humans, etc.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO HOUSE BILL 2215.

HB 2218—NO SMOKING IN PUBLIC BUILDINGS

House Bill 2218 provides for no smoking in public area of any building owned, leased or rented by the State or any department or agency of the State or which is maintained by State monies.

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT HOUSE BILL 2218.
SB 1374—REGULATION AND CERTIFICATION OF PSYCHOLOGISTS

Senate Bill 1374 provides for a strengthening of the ability of the Arizona State Board of Psychologist Examiners to serve the public and to assure high-quality psychological services in this state and other pertinent changes to the certification of psychologists through its board. It also provides that psychologists or other licensed practitioners of the healing arts can provide a statement to the workmen's compensation commission as to the condition of the claimant.

IT WAS MOVED AND CARRIED TO OFFER ACTIVE NON-SUPPORT TO SENATE BILL 1374.

SB 1370—CHIROPRACTIC

Senate Bill 1370 provides for amendments to the chiropractic examining board.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1370.
SB 1326—VETERINARIANS

Senate Bill 1326 provides for amendments to the veterinarians medical practice act and provides for veterinary technicians.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1326.
SB 1372—PHYSICIAN'S ASSISTANTS

Senate Bill 1372 provides that the rules and regulations of the joint Board of Medical and Osteopathy Examiners concerning physician's assistants shall provide for employment and supervision of physician's assistants by licensed physicians or licensed hospitals.

IT WAS MOVED AND CARRIED TO ACTIVELY NON-SUPPORT SENATE BILL 1372.

HB 2201—QUALIFIED HEALTH CARE PLANS

House Bill 2201 provides for qualified health care plans consisting of comprehensive health insurance coverages that all insurers must offer to every citizen of the state; providing income tax incentives; establishing a health care insurance association; requiring

the participation of all insurers transacting insurance in the state; providing that insurers share in the pooling of risks and the costs of the association; prescribing minimum benefit standards and disclosure requirements for all health insurance policies other than qualified health care plans; providing for a health care commission to require financial reporting, uniform systems of accounting, prospective rate review and prohibit discriminatory charges; etc.

IT WAS MOVED AND CARRIED TO OFFER GENERAL NON-SUPPORT TO HOUSE BILL 2201

HB 2279—HEALTH CARE SCREENING SERVICES

House Bill 2279 would prescribe definition of health screening services, providing that the director shall adapt rules and regulations relating to such health screening services providing that the health screening services be conducted in the supervision of a physician, etc. Mr. Jacobson informed the committee that he had drafted this legislation in behalf of his client Howard M. Kravetz, M.D. (multi-health). Wilfred M. Potter, committee member, opposed such legislation on the basis of its ability to advertise.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO HOUSE BILL 2279.

HB 2323; SB 1329—

DENTAL INSURANCE BENEFITS

House Bill 2323 and Senate Bill 1329 provide for mandatory insurance coverage in behalf of dentists if benefits would be provided to a physician.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO HOUSE BILL 2323 AND SENATE BILL 1329.

SB 1098—PREPAID

DENTAL PLAN ORGANIZATION

Senate Bill 1098 would provide for the establishment of prepaid dental plan organizations and prescribing conditions under which they may be certified through the department of insurance, much the same as certification of health care services organizations.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON SENATE BILL 1098.

SB 1204—ALCOHOLISM

Senate Bill 1204 provides certain benefits for care and treatment of alcoholism under insurance contracts.

IT WAS MOVED AND CARRIED TO OFFER GENERAL SUPPORT TO SENATE BILL 1204.

HB 2311—ANATOMICAL GIFTS—EXPENSES

House Bill 2311 would provide for the person or institution receiving the gifts of bodies or parts of bodies through the Department of Health Services as an intermediary to pay all expenses of delivery.

IT WAS MOVED AND CARRIED TO TAKE NO ACTION ON HOUSE BILL 2311.
SB 1355—MARIJUANA

Senate Bill 1355 provides for the decriminalization of possessions of insignificant amounts of marijuana (50 grams).

IT WAS MOVED AND CARRIED TO ACTIVELY SUPPORT SENATE BILL 1355.



Future Medical Meetings

CONTINUING MEDICAL EDUCATION

THE FOLLOWING INSTITUTIONS AND ORGANIZATIONS HAVE RECEIVED ACCREDITATION FOR CONTINUING MEDICAL EDUCATION

ARIZONA STATE HOSPITAL, PHOENIX
DESERT SAMARITAN HOSPITAL, MESA
GOOD SAMARITAN HOSPITAL, PHOENIX
HEALTH MAINTENANCE ASSOCIATES
PHOENIX INDIAN MEDICAL CENTER
MARICOPA COUNTY GENERAL HOSPITAL, PHOENIX
MEMORIAL HOSPITAL, PHOENIX
ST. LUKE'S HOSPITAL AND MEDICAL CENTER, PHOENIX
ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER, PHOENIX
TUCSON HOSPITALS MEDICAL EDUCATION PROGRAM, TUCSON
U. OF A. HEALTH SCIENCES CENTER
VETERANS ADMINISTRATION CENTER, PRESCOTT
VETERANS ADMINISTRATION HOSPITAL, PHOENIX

CME activities designated category I by the person responsible for CME in the above institutions and organizations will receive Category I credit toward the ArMA Certificate in CME and the AMA Physician's Recognition Award.

JULY

PATHOPHYSIOLOGY OF HYPERTENSION

July 11, 1977, Phoenix General Hospital Phoenix, AZ. Sponsor: Phoenix General Hospital Staff Meeting. Contact: Dr. Ramon Alba, 6528 W. Indian School Rd., Phoenix, AZ. Approved for two required hours toward the ArMA Certificate in Continuing Medical Education.

SUMMER MEDICAL SEMINAR

July 30 & 31, 1977, Little American, Flagstaff, AZ. Sponsor: Coconino County Medical Society. Contact: M. Geldstein, M.D., 900 N. San Francisco, Flagstaff, AZ 86001. Approved for 8 required hours toward the ArMA Certificate in Continuing Medical Education.

OCTOBER

25th ANNUAL MEETING OF THE MEDICAL SOCIETY OF THE UNITED STATES AND MEXICO

October 12-15, 1977, Del Webb's Towne House, Phoenix, AZ. Sponsor: Medical Society of the United States and Mexico. Contact: Lucy A. Verneti, M.D., 333 W. Thomas Rd. Ste 207, Phoenix, AZ 85013. Approved for required hours toward the ArMA Certificate in Continuing Medical Education

DERMATOLOGY

October 1-3, 1977, College of Nursing, U. of A., Tucson, AZ. Sponsor: University of Arizona. Contact: John T. Condon Ed.D., 1828 E. Orange Drive, Phoenix, AZ. Approved for 18 required hours toward the ArMA Certificate in Continuing Medical Education.

JANUARY 1978

PEDIATRIC UPDATE 1978

January 16-19, Doubletree Inn, Scottsdale, AZ. Sponsor: Dept. of Pediatrics of St. Joseph's Hospital and Medical Center, Phoenix, AZ. Contact: Melvin L. Cohen, M.D., Dept. of Pediatric Education, St. Joseph's Hospital and Medical Center, 350 W. Thomas Road, Phoenix, AZ 85013. Approved for 16 required hours toward the ArMA Certificate in Continuing Medical Education and A.A.F.P. credits.

MONTHLY OR WEEKLY

OFFICE PSYCHIATRY FOR THE PRIMARY PROVIDER

2nd Monday of month, 4811 N. 7th Street, Phoenix, AZ. Sponsor: Arizona Health Plan. Contact: T. R. Bittker, M.D., Box 5000, Phoenix, AZ 85010. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

FILM READING SESSIONS & SCIENTIFIC MEETINGS

Monthly. Sponsor: Phoenix Radiology Society. Contact: Mrs. Mary Wood, 810 W. Bethany Home Rd., Phoenix, AZ 85013. Approved for 2 required hours per session toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CLINICAL CONFERENCE

Feb. 28, 1977, Marshall Auditorium, Tucson Medical Center, Tucson, AZ. Sponsor: U. of A. College of Medicine & Dept. of IM, Dermatology Sect. Contact: Peter Lynch, M.D., U. of A. College of Medicine, Tucson, AZ 85724.

CLINICAL IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY ROUNDS

Every Friday Noon-1 p.m. Sponsor: U. of A. College of Medicine, Dept. of Internal Medicine, Clinical Immunology Section. Contact: John Boyer, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

ENDOCRINOLOGY SEMINAR

Every Thursday, Noon-1 p.m., 1st, 3rd & 5th Thursday—Rm. N318, VA Hospital, 2nd & 4th Thursday, Rm. 6505, Tucson Medical Center, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

HEMATOLOGY-ONCOLOGY CLINICAL CONFERENCE

Every Tuesday, Noon-1 p.m. 1st, 3rd & 5th Tuesdays—Rm. 6505, AZ Medical Center. 2nd & 4th Tuesdays—Rm. N318, Veterans Adm. Hospital. Sponsor: U. of A. College of Medicine, Dept. of Internal Medicine. Contact: Sidney Salmon, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

GRAND WARD ROUNDS—TRAUMA

Every Tuesday, 8 a.m. Arizona Medical Center, Tucson, AZ. Sponsor: U. of A. College of Medicine, Surgery Dept., Trauma Section. Contact: Martin Silverstein, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PROBLEM CASE WORKSHOPS

3rd Monday of each month 7:30 a.m. Room 4410, Arizona Medical Center, Tucson, AZ. Sponsor: Division of Ophthalmology, U. of A. College of Medicine. Contact: H. E. Cross, M.D., Ph.D., Arizona Medical Center, Dept. of Surgery, Tucson, AZ. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

MEDICAL GRAND ROUNDS

Every Wednesday, Noon-1 p.m. 1st, 3rd & 5th Wednesday—Staff Conf. Rm., VA Hospital, 2nd & 4th Wednesday—Rm. 5403, Arizona Medical Center. Sponsor: U. of A. College of Medicine, Dept. of Internal Medicine. Contact: Jay Smith, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

PSYCHIATRIC GRAND ROUNDS

Every Wed., Sept. to May, 4-5:30 p.m. Rm. 840, Arizona Medical Center, Tucson, AZ. Sponsor: U. of A. College of Medicine Dept. of Psychiatry. Contact: Alan Levenson, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1-1/2 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TRAUMA CONFERENCE

Every Monday, 4 p.m. Rm. 4410, Arizona Medical Center, Tucson, AZ. Sponsor: U. of A. College of Medicine, Dept. of Surgery, Trauma Section. Contact: Martin Silverstein, M.D., U. of A. College of Medicine, Tucson, AZ 85721. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

STAFF EDUCATION CONFERENCE

Wednesdays, Weekly, 1 p.m. Arizona State Hospital, Phoenix, AZ. Sponsor: Arizona State Hospital. Contact: Howard E. Wulsin, M.D., Arizona State Hospital, 2500 E. Van Buren, Phoenix, AZ 85008. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

SURGICAL GRAND ROUNDS

4TH TUESDAY OF EACH MONTH

Hospital Auditorium, Baptist Hospital, Phoenix, AZ. Sponsor: Baptist Hospital Phoenix. Contact: James B. Shields, M.D., 6036 N. 19th Av, Phoenix, AZ 85015. Approved for 1-1/2 required hours per month toward the ArMA Certificate in Continuing Medical Education.

PATIENT STAFFING CONFERENCE

Three times weekly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

CAMELBACK HOSPITAL CLINICAL CONFERENCE

Third Tuesday monthly. Camelback Hospital, Phoenix, AZ. Sponsor: Camelback Hospital. Contact: Medical Director, Camelback Hospital, 5055 N. 34th St., Phoenix, AZ 85018. Approved for 1 elective hour per session toward the ArMA Certificate in Continuing Medical Education.

COUNTER TRANSFERENCE GROUP

Weekly, Thurs. 8-10 p.m. Sponsor: Phoenix Psychiatric Council. Contact: James E. Campbell, M.D., 5051 N. 34th St., Phoenix, AZ 85018. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

DESERT SAMARITAN HOSPITAL

Wednesday Evenings 7 p.m. Sponsor: Desert Samaritan Hospital. Contact: L. A. Rosati, M.D., Laboratory, Desert Samaritan Hospital, Mesa, AZ 85202. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

PULMONARY DISEASE GRAND ROUNDS

Wednesdays—12 Noon. D-5 North Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Pulmonary Disease Teaching Service, Good Samaritan Hospital. Contact: Bernard E. Levine, M.D., Pulmonary Function Laboratory, Good Samaritan Hospital, 1033 E. McDowell Hospital, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

CLINICAL CANCER CONFERENCE

Wednesday every month, Butler Bldg. Conference Room, Good Samaritan Hospital, Phoenix, AZ. Sponsor: Good Samaritan Hospital. Contact: John A. Bruner, M.D., 926 E. McDowell Road, Phoenix, AZ 85006. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

TUMOR BOARD CONFERENCE

Every Friday at Noon, Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Phoenix Memorial Hospital. Contact: Howard Kimball, M.D., 333 West Thomas Road, Phoenix, AZ 85013. Approved for credit toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEDICAL EDUCATION SEMINAR

Third Monday of the Month, 6:30 p.m., Kiva Conference Room, Phoenix Memorial Hospital. Sponsor: Medical Staff of Memorial Hospital. Contact: George Scharf, M.D., 1201 South 7th Avenue, Phoenix, AZ 85007. Approved for 1 required hour per session toward the ArMA Certificate in Continuing Medical Education.

MONTHLY MEETING OF TUCSON RADIOLOGISTS

1st Tues. of Month, Plaza International, Tucson, AZ. Sponsor: U. of A. Medical Center, Dept. of Radiology. Contact: Irwin M. Freundlich, M.D., Arizona Medical Center, Dept. of Radiology, Tucson, AZ 85724. Approved for 2 required hours toward the ArMA Certificate in Continuing Medical Education.

FAMILY PRACTICE CONFERENCE

1st Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

OBSCURITY & MORALITY CONFERENCE

2nd Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Dir. of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

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4th Monday, Monthly, 12:45 p.m., Scottsdale Memorial Hospital, Scottsdale, AZ. Sponsor: Medical Staff. Contact: R. C. Good, M.D., Director of Medical Education, 7300 E. 4th St., Scottsdale, AZ. Approved for 1 elective hour per conference toward the ArMA Certificate in Continuing Medical Education.

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CARDIOLOGY CONFERENCE

Weekly—Friday 8-9 a.m., St. Mary's Hospital Auditorium, Tucson, AZ. Sponsor: St. Mary's Hospital. Contact: A. L. Forte, M.D., St. Mary's Hospital, Tucson, AZ 85724. Approved for one required hour toward the ArMA Certificate in Continuing Medical Education.

GRAND ROUNDS

Each Thursday 7 a.m.-8 a.m., St. Mary's Hospital and Health Center, Sponsor: Depts. of Medicine, Surgery, Radiology, Pathology and Family Practice. Contact: Richard Silver, M.D., Chairman, Medical Education and Library Committee, Century Medical Plaza, Suite 160, 1701 West St. Mary's Road, Tucson, AZ 85703. Approved for 1 required hour per round toward the ArMA Certificate in Continuing Medical Education.

GI CONFERENCE

(Special Program with U. of A. Consultants) 4th Friday, 1 p.m., T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

G.I.-RADIOLOGY CLINICAL CORRELATION CONFERENCE

1st and 3rd Monday, 1 p.m., C435. Sponsor: VA Hospital, Phoenix, AZ. Contact: Jasper L. McPhail, M.D., Veterans Administration Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

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1st and 3rd Tuesday, 1 p.m., T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CARDIOLOGY CONFERENCE

2nd Thursday, 1 p.m., T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

CLINICOPATHOLOGY CONFERENCE

4th Thursday of 3rd Mo. (Mar., June., Sept. & Dec.), 1 p.m., T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Education.

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1st and 3rd Thursday, 1 p.m., T-5. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

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SURGERY-PATHOLOGY CONFERENCE

Each Thursday, 7 a.m., 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

DERMATOLOGY CONFERENCE

1st, 2nd & 3rd Wednesday. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

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2nd and 4th Tuesday, 1 p.m., 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th & Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

UROLOGY-PATHOLOGY CONFERENCE

Each Wednesday, 7 a.m., 2128. Sponsor: VA Hospital Phoenix. Contact: Jasper L. McPhail, M.D., VA Hospital, 7th and Indian School Rd., Phoenix, AZ. Approved for required hours toward the ArMA Certificate in Continuing Medical Education.

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A brief summary of the Prescribing Information for
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WARNING—Lasix (furosemide) is a potent diuretic which if given in excessive amounts can lead to a profound diuresis with water and electrolyte depletion. Therefore, careful medical supervision is required, and dose and dose schedule have to be adjusted to the individual patient's needs. (See under "Dosage and Administration.")

Indications—Lasix (furosemide) is indicated for the treatment of the edema associated with congestive heart failure, cirrhosis of the liver, and renal disease, including the nephrotic syndrome.

Hypertension—Lasix (furosemide) may be used for the treatment of hypertension alone or in combination with other antihypertensive drugs. Hypertensive patients who cannot be adequately controlled with thiazides will probably also not be adequately controllable with Lasix (furosemide) alone.

CONTRAINDICATIONS—Because animal reproductive studies have shown that Lasix (furosemide) may cause fetal abnormalities, the drug is contraindicated in women of childbearing potential. (See "Additional Information.")

Lasix (furosemide) is contraindicated in anuria. If increasing azotemia and oliguria occur during treatment of severe progressive renal disease, the drug should be discontinued. In hepatic coma and in states of electrolyte depletion, therapy should not be instituted until the basic condition is improved or corrected. Lasix (furosemide) is contraindicated in patients with a history of hypersensitivity to this compound.

Warnings—Excessive diuresis may result in dehydration and reduction in blood volume, with circulatory collapse and with the possibility of vascular thrombosis and embolism, particularly in elderly patients. Excessive loss of potassium in patients receiving digitalis glycosides may precipitate digitalis toxicity. Care should also be exercised in patients receiving potassium depleting steroids.

Frequent serum electrolyte, CO₂ and BUN determinations should be performed during the first few months of therapy and periodically thereafter, and abnormalities corrected or the drug temporarily withdrawn.

In patients with hepatic cirrhosis and ascites, initiation of therapy with Lasix (furosemide) is best carried out in the hospital. Sudden alterations of fluid and electrolyte balance in patients with cirrhosis may precipitate hepatic coma; therefore, strict observation is necessary during the period of diuresis. Supplemental potassium chloride and, if required, an aldosterone antagonist are helpful in preventing hypokalemia and metabolic alkalosis.

Patients should be observed regularly for the possible occurrence of blood dyscrasias, liver damage, or other idiosyncratic reactions.

In those instances where potassium supplementation is required, an oral liquid preparation should be used rather than enteric-coated potassium salts.

There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated thiazides with potassium salts. These lesions may occur with enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides, or certain other oral diuretics.

These small-bowel lesions have caused obstruction, hemorrhage, and perforation. Surgery was frequently required, and deaths have occurred.

Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneously. Therefore, coated potassium-containing formulations should be administered only when indicated and should be discontinued immediately if abdominal pain, distention, nausea, vomiting, or gastrointestinal bleeding occurs.

Patients with known sulfonamide sensitivity may show allergic reactions to Lasix (furosemide).

Precautions—As with any potent diuretic, electrolyte depletion may occur during therapy with Lasix (furosemide), especially in patients receiving higher doses and a restricted salt intake. Electrolyte depletion may manifest itself by weakness, dizziness, lethargy, leg cramps, anorexia, vomiting, and/or mental confusion.

Asymptomatic hyperuricemia can occur and gout may rarely be precipitated. Reversible elevations of BUN may be seen. These have been observed in association with dehydration, which should be avoided, particularly in patients with renal insufficiency.

When parenteral use of Lasix (furosemide) precedes its oral use, it should be kept in mind that cases of tinnitus and reversible hearing impairment have been reported. There have also been some reports of cases in which irreversible hearing impairment occurred. Usually, ototoxicity has been reported when Lasix (furosemide) was injected rapidly in patients with severe impairment of renal function at doses exceeding several times the usual recommended dose and in whom other drugs known to be ototoxic were often given. If the physician elects to use high dose parenteral therapy in patients with severely impaired renal function, controlled intravenous infusion is advisable (for adults, it has been reported that an infusion rate not exceeding 4 mg Lasix [furosemide] per minute has been used).

Increases in blood glucose, and alterations in glucose tolerance tests with abnormalities of the fasting and two-hour postprandial sugar have been observed, and rare cases of precipitation of diabetes mellitus have been reported.

Lasix (furosemide) may lower serum calcium levels, and rare cases of tetany have been reported.

Patients receiving high doses of salicylates, in conjunction with Lasix (furosemide) may experience salicylate toxicity at lower doses because of competitive renal excretory sites.

Diuretics such as furosemide may enhance the nephrotoxicity of cephaloridine. Therefore, Lasix (furosemide) and cephaloridine should not be administered simultaneously.

Sulfonamide diuretics have been reported to decrease arterial responsiveness to pressor amines and to enhance the effect of tubocurarine. Great caution should be exercised in administering curare or its deriva-

tives to patients undergoing therapy with Lasix (furosemide), and it is advisable to discontinue Lasix (furosemide) for one week prior to any elective surgery.

Adverse Reactions—Various forms of dermatitis, including urticaria and rare forms of exfoliative dermatitis, erythema multiforme, pruritus, paresthesia, blurring of vision, postural hypotension, nausea, vomiting, or diarrhea.

Anemia, leukopenia, aplastic anemia, and thrombocytopenia (with purpura). Rare cases of agranulocytosis which responded to treatment.

In addition, the following rare adverse reactions have been reported; however, relationship to the drug has not been established with certainty: sweet taste, oral and gastric burning, paradoxical swelling, headache, jaundice, thrombophlebitis and emboli and acute pancreatitis.

Lasix (furosemide)-induced diuresis may be accompanied by weakness, fatigue, lightheadedness or dizziness, muscle cramps, thirst, increased perspiration, urinary bladder spasm, and symptoms of urinary frequency.

Dosage and Administration

ADULTS

The usual adult dose of Lasix (furosemide) is 20 to 80 mg given as a single dose.

If the diuretic response with a single dose of 20 to 80 mg is not satisfactory, the following schedule should be used: Increase this dose by increments of 20 or 40 mg not sooner than 6 to 8 hours after the previous dose until the desired diuretic effect has been obtained. This individually determined single dose should then be given once or twice daily. The dose of Lasix (furosemide) may be carefully titrated up to 600 mg per day in those patients with severe clinical edematous states.

With doses exceeding 80 mg/day and given for prolonged periods, careful clinical and laboratory observations are particularly advisable.

Hypertension—The usual dose of Lasix (furosemide) is 40 mg twice daily both for initiation of therapy and for maintenance. Careful observations for changes in blood pressure must be made when this compound is used with other antihypertensive drugs, especially during initial therapy. The dosage of other agents must be reduced by at least 50 percent as soon as Lasix (furosemide) is added to the regimen to prevent excessive drop in blood pressure. As the blood pressure falls under the potentiating effect of Lasix (furosemide), a further reduction in dosage, or even discontinuation, of other antihypertensive drugs may be necessary. It is further recommended, if 40 mg twice daily does not lead to a clinically satisfactory response, to add other hypotensive agents, e.g., reserpine, rather than to increase the dose of Lasix (furosemide).

INFANTS AND CHILDREN

Pediatric Administration: The usual initial dose of oral Lasix in infants and children is 2 mg/kg body weight, given as a single dose. If the diuretic response is not satisfactory after the initial dose, dosage may be increased by 1 or 2 mg/kg not sooner than 6 to 8 hours after the previous dose. Doses greater than 6 mg/kg body weight are not recommended.

For maintenance therapy in infants and children, the dose should be adjusted to the minimum effective level.

How Supplied—Lasix Tablets 40 mg (furosemide) supplied as white, round, monogrammed, scored tablets.

Lasix Tablets 20 mg (furosemide) supplied as white, oval, monogrammed tablets.

Note: Dispense in dark containers. Exposure to light may cause slight discoloration which, however, does not alter potency.

Additional Information

Toxicology

The acute toxicity of Lasix (furosemide) has been determined in mice, rats, and dogs. In all three animal species, the oral LD₅₀ of Lasix (furosemide) exceeded 1000 mg/kg of body weight, while the intravenous LD₅₀ ranged from 300 to 680 mg/kg. Intragastric injection of the drug in newborn rats resulted in an LD₅₀ of 380 mg/kg.

The acute toxicity of high doses of Lasix (furosemide) was characterized by convulsions, paralysis, and collapse. Surviving animals often became dehydrated and depleted of electrolytes due to the diuresis induced by Lasix (furosemide). In the newborn rats, intragastric injection of the drug caused hyperactivity and anorexia.

Chronic toxicity studies with Lasix (furosemide) were done in rats and dogs. In a one-year study in rats, renal tubular degeneration occurred, with all doses higher than 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day). A six-month study in dogs revealed calcification and scarring of the renal parenchyma at all doses above 10 mg/kg (83 percent of the maximal recommended human dose of 600 mg per day).

Reproductive Studies

The effects of Lasix (furosemide) on embryonic and fetal development and on pregnant dams were studied in mice, rats, and rabbits.

Lasix (furosemide) caused unexplained maternal deaths and abortions in the rabbit when 50 mg/kg (4 times the maximal recommended human dose of 600 mg per day) was administered between days 12 to 17 of gestation. In a previous study the lowest dose of only 25 mg/kg (2 times the maximal recommended human dose of 600 mg per day) caused maternal deaths and abortions. In a third study, none of the pregnant rabbits survived a dose of 100 mg/kg. Data from the above studies indicate fetal lethality which can precede maternal deaths.

The results of the mouse study and one of the three rabbit studies also showed an increased incidence of hydronephrosis (distention of the renal pelvis and, in some cases, of the ureters) in fetuses derived from treated dams as compared to the incidence in fetuses from the control group.



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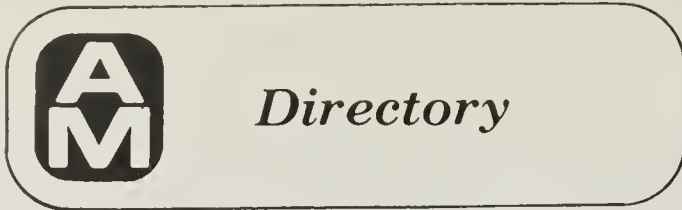
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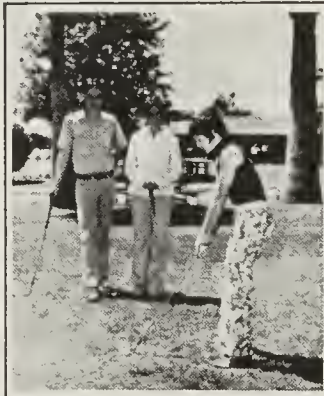
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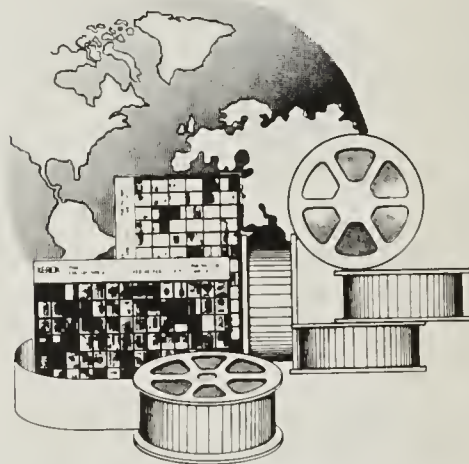
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